Human Resources
Development Canada

Développement des
ressources humaines Canada

BRITISH
COLUMBIA
Ministry of Advanced Education,
Training and Technology

LEGISLATIVE LIBRARY OF BRITISH COLUMBIA
3 3298 00251 5014

Work Futures

British Columbia Occupational Outlooks

2000 Edition

LEGISLATIVE LIBRARY
VICTORIA BC V8V 1X4 MAY 2 2 2001

+3

Canadian Cataloguing in Publication Data

Main entry under title:

Work futures

Copublished by: British Columbia. Ministry of Advanced Education, Training and Technology.

Includes index.
ISBN 0-7726-4389-X

1. Occupations—British Columbia. 2. Vocational guidance—British Columbia. 3. Job descriptions—British Columbia. 4. Employment forecasting—British Columbia. I. Canada. Human Resources Development Canada. II. British Columbia. Ministry of Advanced Education, Training and Technology.

HF5382.5.C2W67 2000 331.7'02'09711 C00-911120-4

To order copies of this publication, contact:

Marketing Department
Open Learning Agency
4355 Mathissi Place
Burnaby, British Columbia
Canada V5G 4S8
Telephone: (604) 431-3210
Toll-free: 1-800-663-1653
Fax: (604) 431-3381

Work Futures
Order number: MN1780
ISBN 0-7726-4389-X
Order on-line at:
http://www.ola.bc.ca/ol/services/market/toc.html

This publication is available on the Internet at
http://workfutures.bc.ca

ACKNOWLEDGEMENTS

Work Futures: British Columbia Occupational Outlooks, 2000 Edition was jointly produced by Human Resources Development Canada: B.C./Yukon Region, and the B.C. Ministry of Advanced Education, Training and Technology.

Project managers were Angie Poutissou of Human Resources Development Canada, and Kathy Stephens of the B.C. Ministry of Advanced Education, Training and Technology.

Analysts, writers, editors and others who contributed to this edition were Carole Clark, Sharon Churchill, Ian Darling, Jerry Der, Nosa Ero, Jaie Fell, Joanne Ferreira, Cora Foerstner, David Gaffney, Lee Gan, Nicole Hansen, Renee Kaziechko, Jacquie McDonald, Brian McGowan, Bruce MacInnis, Robert Mattioli, Heather Middlemass, Arjen Ordeman, Stephen Pal, Dave Peniuk, Angie Poutissou, Dylan Ramshaw, Pat Rasmussen, Frank Reinhardt, Joan Richardt, Ryan Rodford, Michael Sawyer, Sheila Simard, Rod Smelser, Kathy Stephens, Cathy Stock, Frank Tanaka, and Leanna Young. Melinda Maunsell provided final editing of the profiles presented in this publication.

Desktop publishing was provided by Kay Gorse of Human Resources Development Canada. Bayleaf Software Inc., designed the software used in the electronic compilation and dissemination of this publication. Photographs were provided by Stone/Vancouver.

We wish to thank the many trade associations, professional societies, unions, industrial organizations and government agencies that provided us with valuable information and insights.

Text in this publication is in the public domain and, with appropriate acknowledgement, may be reproduced without permission. Comments about the contents of this publication and suggestions for improving it are welcome. Please address them to:

Angie Poutissou
Strategic Services and External Relations
Human Resources Development Canada
15th Floor, 300 West Georgia Street
Vancouver, B.C. V6B 6G3

Kathy Stephens
Youth and Labour Market Services Branch
B.C. Ministry of Advanced Education, Training
and Technology
PO Box 9888 STN PROV GOVT
Victoria, B.C. V8W 9T6

TABLE OF CONTENTS

Introduction

1. How-to-Use Guide . . . 1
2. Choosing a Career . . . 8
3. Developing Skills for Today's Workplace . . . 23
4. General Career Information Resources . . . 32
5. Information Technology . . . 33

Occupational Profiles

0 Management Occupations . . . 37
1 Business, Finance and Administration Occupations . . . 45
2 Natural and Applied Sciences and Related Occupations . . . 119
3 Health Occupations . . . 193
4 Occupations in Social Science, Education and Government Service . . . 259
5 Occupations in Art, Culture, Recreation and Sport . . . 299
6 Sales and Service Occupations . . . 341
7 Trades, Transport and Equipment Operators and Related Occupations . . . 427
8 Occupations Unique to Primary Industry . . . 515
9 Occupations Unique to Processing, Manufacturing and Utilities . . . 551

Appendices

Appendix A Technical Comments . . . 590
Appendix B Apprenticeship . . . 597
Appendix C Guide to B.C.'s Public Post Secondary Instituions . . . 600

Indices

Alphabetical Index of Occupations . . . 621
Index of Occupations by National Occupational Classification . . . 651
Index of Occupations by Skill Level . . . 654

NOC Matrix . . . 658

Feedback . . . 661

1. HOW-TO-USE GUIDE

Learning About *Work Futures*

Work Futures is a comprehensive resource that describes close to 200 occupational groups, representing 98% of the British Columbia labour market. It has been produced jointly by Human Resources Development Canada and the B.C. Ministry of Advanced Education, Training and Technology.

This information has been designed for learners, individuals interested in changing careers or re-entering the labour market, and for career practitioners. Representatives of industry, labour, governments and education have contributed to the content of *Work Futures*, and the result is a comprehensive view of present and future labour market conditions.

The profiles in *Work Futures* provide detailed information about the particular occupation or occupational group they describe, and each profile has the same format:

- Data Summary Table (B.C. Employment Trends and Projected Demand, Estimated Openings and Annual Growth for 1998 to 2008, Main Industries of Employment, Employment by Region, and Self-employment)
- Nature of the Work
- Main Duties
- Education and Training
- Working Conditions
- Employment Prospects
- Additional Information
- Related Occupations

Using *Work Futures* for Career Development

The labour market information provided in *Work Futures* is essential to helping people plan their careers and make decisions about their working lives. The information you find here will assist you in following all three steps of the career planning process. This process is described more fully in section 2, *Choosing a Career*.

Work Futures can help with ***self-assessment*** by providing information on what the work in a given occupational group entails. This helps you determine if the work might suit your goals and interests.

Work Futures will also help you to ***use labour market information*** (LMI) that is related to career planning.

Finally, this publication can also help you to a ***make career decision*** by providing information on what education or training is needed, how long the training takes and where in B.C. it is offered.

What do those numbers after the word NOC mean?

The numbers that appear just above the data table in each profile (e.g. NOC 3121) are occupational codes from the National Occupational Classification (NOC) developed by Human Resources Development Canada. Each occupation is classified into a NOC by skill type and skill level (see page 654 to 656). NOC codes are included in *Work Futures* because career centres often use them for tracking occupational information. There is an index by NOC at the back of this book and a further explanation of the NOC in the Technical Notes.

Sitting Down With *Work Futures*

At over 600 pages, *Work Futures* is not meant to be read from cover to cover. It is best used to research specific occupations. Here are some different ways to start exploring the occupations in *Work Futures:*

- Alphabetical Index: If you have completed a self-assessment (see pages 621 to 650) or already have an idea of some occupations that interest you, just look for the specific titles in the Alphabetical Index at the back of the book.
- Table of Contents: Another option is to look at the chapters in the **Table of Contents** at the front of the publication. Here you will see occupational groups listed by occupational type:
  - Management
  - Business, Finance and Administration
  - Natural and Applied Sciences
  - Health
  - Social Science, Education, and Government
  - Art, Culture, Recreation and Sport
  - Sales and Service
  - Trades, Transport and Equipment Operating
  - Occupations in Primary Industries
  - Occupations in Processing, Manufacturing and Utilities

Most of these chapters contain at least 25 occupational profiles, so you may find that there is still too much information to digest at one time. You can further narrow your search by looking only at occupations that require a certain level of education or training. For example, if you are interested in occupations in health that do not require a university education, then you can choose to read about only those occupations that require college training or less. At the start of each chapter, the occupations profiled are listed by required skill *level* according to the four NOC levels described below.

- Skill Level Index: Still another option, if you do not yet have any idea of what kind of work or skill type that interests you, is to look at the Index of Occupations by Skills Level on pages 654 to 656 at the back of the publication. Here you will find all the occupations profiled in *Work Futures* organized by Skill Level.

Skill Level is defined as the amount and type of education and training required to enter and perform the duties of an occupation. The Skill Levels defined by NOC (see below) are broad categories that reflect commonly accepted entry routes for employment.

These are the NOC Skill Levels categories for occupations in *Work Futures*:

Skill Levels in *Work Futures*

Skill Level A -	**Professional Occupations (University education)**
Skill Level B -	**Technical, Paraprofessional and Skilled Occupations (College education, including apprenticeship training)**
Skill Level C -	**Intermediate Occupations (High school, plus some training courses or on-the-job training)**
Skill Level D -	**Labouring and Elemental Occupations (Up to two years of secondary school plus some on-the-job training)**

These categories are meant only to be guidelines to help individuals understand the generally-accepted level of education that employers expect a person to have in order to work in an occupational area. It is also important to remember that having a particular level of education doesn't guarantee that an individual will have the skills necessary to work successfully in a particular occupation.

How Each Profile is Organized

Each occupational profile in the publication follows the same format, making it easier to compare occupations. The following describes each section of a profile and gives some hints on how to interpret the information provided.

Data Summary Table

This table provides a snapshot of the main statistical information discussed in the profile. It enables you to compare occupations at a glance on such items as rate of self-employment or employment demand. An example of a Data Summary Table is provided for the NOC occupation 1111: Financial Auditors and Accountants; see the text box for details.

Financial Auditors and Accountants

NOC 1111

B.C. Employment Trends and Projected Demand			
	1990	1998	2008
Number Employed	12,350	16,680	21,350
Estimated Openings 1998-2008			
	Growth (Net)	Attrition	Total
	4,670	3,190	7,860
Annual Growth 1998-2008		2.5%	
Main Industries of Employment			
Professional Business Services		43%	
Finance, Insurance and Real Estate		7%	
Federal Administration		6%	
Employment by Region			
Lower Mainland		70%	
Vancouver Island		13%	
Northern B.C.		6%	
Okanagan/Kootenay		12%	
Self Employment		28%	

Nature of the Work

This section provides general descriptions of the occupational group, including the kinds of firms that hire workers and commonly used occupational titles.

The descriptions of duties and responsibilities can help you determine if the work might be of interest to you.

Education and Training

This section provides information on the education and training required of workers in the group including length of programs and where the training is offered in B.C.'s public post-secondary schools. However, if the training is available only at a private institution, or at an out-of-province institution, this information is given. This section also describes the experience and employability skills employers prefer.

Knowing where a program is offered and the length of the program can help in setting up a training budget.

Knowing what prerequisite courses you need to take before applying to a program is necessary information to include in an action plan.

Guide to B.C.'s Public Post-Secondary Institutions.

The guide to B.C.'s public post-secondary institutions on pages 600 to 620 summarizes the more than 1,380 programs offered at B.C.'s public institutions. This guide indicates where the programs are offered at B.C.'s 28 public post-secondary institutions as well as the type of credential awarded. Also note that you can get this information on the Internet at http://bcopportunities.com

Training and educational institutions vary in quality. Students should know that employers often prefer graduates from particular institutions, so choosing the right program should be done with a great deal of care and consideration. The next chapters offer guidance on how to choose a training or education program that meets your needs.

Working Conditions

This section starts with descriptions of typical working hours; for example, whether the work involves regular business hours or shift work. Also described is the physical work environment, such as an office setting versus an outdoor one or a dirty setting versus a clean one.

Compare Your Occupation of Interest with the All-Occupation Average in B.C.

Average Earnings (1995)	
All Workers	$27,900
Full-time, Full-year Workers	$39,400
Proportion Working Part time	26%
Proportion Working Part year	45%
Proportion of Workers who are Women	46%
Age of Workers	
15 to 24 years	15%
25 to 34 years	25%
35 to 44 years	28%
45 to 54 years	21%
55 to 64 years	9%
65+ years	2%
Average Age	38
Self-Employment	15%
Unemployment	9.6%
Geographic Distribution	
Lower Mainland	57%
Vancouver Island	18%
Okanagan/Kootenay	15%
Northern B.C.	10%

Source: Census 1996

Knowing this information will help you determine if the occupation suits your personal preferences.

The **Working Conditions** section also reports the main labour market characteristics of the occupational group, as shown in the following table. You will be able to compare an occupation of interest to the all-occupation averages for the following labour market characteristics:

- ***Earnings***
  If you have strong expectations or needs with regard to income, you should know how much people in different occupations normally earn.
- ***Part-time and Full-time Work***
  Again, if you have strong preferences or needs with regard to income or lifestyle, you will need to know your chances of getting full-time or part-time work.
- ***Gender and Age Mix***
  It may be helpful to know if the occupation is opening up to women or to younger or older workers. For example, women can find many opportunities in engineering, but they would have to be prepared to work primarily with men who currently dominate the occupation.
- ***Self-Employment***
  While self-employment is increasing in most occupations, there is a greater proportion in certain lines of work. Do you currently have entrepreneurial skills or do they need to be developed? See section 3, *Developing Skills for Today's Workplace* for a further description of entrepreneurial skills.
- ***Unemployment***
  Higher-than-average unemployment usually means that workers may have difficulty finding stable work or that working conditions are not attractive or are deteriorating relative to those in other occupations. Conversely, lower-than-average unemployment usually means that finding stable work may be relatively easier and working conditions are attractive or improving.
- ***Geographic Distribution of Work***
  Where in B.C. are you willing or able to work? For some occupations, geography dictates opportunity. For other types of work, information technology (i.e. the Internet, e-mail, etc.) now offers people the possibility of living wherever they want to and continuing to work at their occupation.

  However, if you are considering relocation and want to find a job in that community, you need to research whether there is demand for your skills or expertise. You should also determine the cost and availability of housing. In some areas of B.C., affordable housing is difficult to find. Ideally, people should have work and accommodation secured before relocating.

choose to read about only those occupations that require college training or less. At the start of each chapter, the occupations profiled are listed by required skill *level* according to the four NOC levels described below.

- Skill Level Index: Still another option, if you do not yet have any idea of what kind of work or skill type that interests you, is to look at the Index of Occupations by Skills Level on pages 654 to 656 at the back of the publication. Here you will find all the occupations profiled in *Work Futures* organized by Skill Level.

Skill Level is defined as the amount and type of education and training required to enter and perform the duties of an occupation. The Skill Levels defined by NOC (see below) are broad categories that reflect commonly accepted entry routes for employment.

These are the NOC Skill Levels categories for occupations in *Work Futures*:

Skill Levels in *Work Futures*

Skill Level A -	**Professional Occupations (University education)**
Skill Level B -	**Technical, Paraprofessional and Skilled Occupations (College education, including apprenticeship training)**
Skill Level C -	**Intermediate Occupations (High school, plus some training courses or on-the-job training)**
Skill Level D -	**Labouring and Elemental Occupations (Up to two years of secondary school plus some on-the-job training)**

These categories are meant only to be guidelines to help individuals understand the generally-accepted level of education that employers expect a person to have in order to work in an occupational area. It is also important to remember that having a particular level of education doesn't guarantee that an individual will have the skills necessary to work successfully in a particular occupation.

How Each Profile is Organized

Each occupational profile in the publication follows the same format, making it easier to compare occupations. The following describes each section of a profile and gives some hints on how to interpret the information provided.

Data Summary Table

This table provides a snapshot of the main statistical information discussed in the profile. It enables you to compare occupations at a glance on such items as rate of self-employment or employment demand. An example of a Data Summary Table is provided for the NOC occupation 1111: Financial Auditors and Accountants; see the text box for details.

Financial Auditors and Accountants

NOC 1111

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	12,350	16,680	21,350

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
4,670	3,190	7,860

Annual Growth 1998-2008	2.5%
Main Industries of Employment	
Professional Business Services	43%
Finance, Insurance and Real Estate	7%
Federal Administration	6%
Employment by Region	
Lower Mainland	70%
Vancouver Island	13%
Northern B.C.	6%
Okanagan/Kootenay	12%
Self Employment	28%

Nature of the Work

This section provides general descriptions of the occupational group, including the kinds of firms that hire workers and commonly used occupational titles.

The descriptions of duties and responsibilities can help you determine if the work might be of interest to you.

Education and Training

This section provides information on the education and training required of workers in the group including length of programs and where the training is offered in B.C.'s public post-secondary schools. However, if the training is available only at a private institution, or at an out-of-province institution, this information is given. This section also describes the experience and employability skills employers prefer.

Knowing where a program is offered and the length of the program can help in setting up a training budget.

Knowing what prerequisite courses you need to take before applying to a program is necessary information to include in an action plan.

+6

Guide to B.C.'s Public Post-Secondary Institutions.

The guide to B.C.'s public post-secondary institutions on pages 600 to 620 summarizes the more than 1,380 programs offered at B.C.'s public institutions. This guide indicates where the programs are offered at B.C.'s 28 public post-secondary institutions as well as the type of credential awarded. Also note that you can get this information on the Internet at *http://bcopportunities.com*

Training and educational institutions vary in quality. Students should know that employers often prefer graduates from particular institutions, so choosing the right program should be done with a great deal of care and consideration. The next chapters offer guidance on how to choose a training or education program that meets your needs.

Working Conditions

This section starts with descriptions of typical working hours; for example, whether the work involves regular business hours or shift work. Also described is the physical work environment, such as an office setting versus an outdoor one or a dirty setting versus a clean one.

Compare Your Occupation of Interest with the All-Occupation Average in B.C.

Average Earnings (1995)	
All Workers	$27,900
Full-time, Full-year Workers	$39,400
Proportion Working Part time	26%
Proportion Working Part year	45%
Proportion of Workers who are Women	46%
Age of Workers	
15 to 24 years	15%
25 to 34 years	25%
35 to 44 years	28%
45 to 54 years	21%
55 to 64 years	9%
65+ years	2%
Average Age	38
Self-Employment	15%
Unemployment	9.6%
Geographic Distribution	
Lower Mainland	57%
Vancouver Island	18%
Okanagan/Kootenay	15%
Northern B.C.	10%
Source: Census 1996	

Knowing this information will help you determine if the occupation suits your personal preferences.

The **Working Conditions** section also reports the main labour market characteristics of the occupational group, as shown in the following table. You will be able to compare an occupation of interest to the all-occupation averages for the following labour market characteristics:

- ***Earnings***
  If you have strong expectations or needs with regard to income, you should know how much people in different occupations normally earn.
- ***Part-time and Full-time Work***
  Again, if you have strong preferences or needs with regard to income or lifestyle, you will need to know your chances of getting full-time or part-time work.
- ***Gender and Age Mix***
  It may be helpful to know if the occupation is opening up to women or to younger or older workers. For example, women can find many opportunities in engineering, but they would have to be prepared to work primarily with men who currently dominate the occupation.
- ***Self-Employment***
  While self-employment is increasing in most occupations, there is a greater proportion in certain lines of work. Do you currently have entrepreneurial skills or do they need to be developed? See section 3, *Developing Skills for Today's Workplace* for a further description of entrepreneurial skills.
- ***Unemployment***
  Higher-than-average unemployment usually means that workers may have difficulty finding stable work or that working conditions are not attractive or are deteriorating relative to those in other occupations. Conversely, lower-than-average unemployment usually means that finding stable work may be relatively easier and working conditions are attractive or improving.
- ***Geographic Distribution of Work***
  Where in B.C. are you willing or able to work? For some occupations, geography dictates opportunity. For other types of work, information technology (i.e. the Internet, e-mail, etc.) now offers people the possibility of living wherever they want to and continuing to work at their occupation.

  However, if you are considering relocation and want to find a job in that community, you need to research whether there is demand for your skills or expertise. You should also determine the cost and availability of housing. In some areas of B.C., affordable housing is difficult to find. Ideally, people should have work and accommodation secured before relocating.

- ***Sensitivity to Business Cycles and Seasonal Factors***
  It is important to know if employment in an occupation is usually stable, or if periods of inactivity can be expected. For example, occupations which may be among the quickest to decline during an economic slowdown may also be among the first to rebound during a recovery. These occupations are said to be sensitive to business conditions and this is noted where applicable.

- ***Top Industry Sectors***
  Knowing what kind of firms or organizations employ most of the workers in an occupational group can help in starting a job search. Once you know the top industries that hire, you can seek out specific companies or organizations in the industry by looking in the Yellow Pages or asking for an appropriate directory at your local library. Concentrating on the industries which are most likely to hire workers in a given occupation can increase the chances of a faster, more successful job search.

- ***Size of the Occupation***
  Information about the size of the occupational group and recent employment trends from 1990 to 1998 are given. Knowing the size of an occupational group will give you a sense of several dimensions of the occupation. For example, large occupations generally have more replacement (attrition and turnover) openings than small occupations.

Employment Prospects

This section contains information on future labour market demand conditions for the occupation and the factors that affect them. This information is presented in both statistical and narrative format.

- ***Numerical Projections***
  Projections are from the Canadian Occupational Projection System (COPS) and include:
  - the average annual percent change in the number of people working in the occupation between 1998 and 2008.
  - the number of openings projected over the 1998 to 2008 period, including both the number created as a result of growth in the economy (net growth) as well as those expected as a result of retirement or death.

The COPS projections in *Work Futures* are for the province of B.C. as a whole. It may be that opportunities in your region or community will be better or worse than those described here.

No one can foresee the future

Although the numerical projections used in *Work Futures* are based on the best judgment of specialists using the most sophisticated forecasting tools available, please use the estimates and projections in *Work Futures* with caution. It is best to use the numbers as guidelines.

Labour market conditions and economic conditions change so quickly these days that no one should make occupational or educational decisions based only on the predicted demand for the occupation. The most useful part of *Work Futures* is the descriptive (narrative) information about occupations and the labour market. This material was gathered from experts in industry, labour, government and education and offers an up-to-date picture of each occupational group.

In this new world of work, the question, "Where will the jobs be?" doesn't apply any more. A better question to ask for the changing labour market is, "What am I good at and where will the opportunities be for me to apply my special skills and knowledge?"

The projections are based on a set of assumptions about how the economy is likely to change between 1998 and 2008. It is important for readers to note that continuing globalization, technological developments and political, social and economic change make accurate forecasting difficult. Please use these estimates and projections with caution.

It is also important to note that the COPS projections of ***employment demand*** (the estimated number of openings) do not consider ***employment supply*** (the number of individual workers who are available to fill those employment demands). Therefore, the projections used in *Work Futures* are simply projections of employment demand, and are not forecasts of shortages and surpluses of workers for particular occupational groups.

Whenever possible, information from industry, labour, government and education on current or projected surpluses or shortages of workers in an occupation is given. A shortage or oversupply of qualified and available workers will affect the competitiveness of the job market for a given occupation. When there are surpluses of workers, applicants may have to search for a longer time, accept a less desirable offer, find employment in another occupation, or face extended unemployment.

20% What the Numbers Mean !#*?

EMPLOYMENT OPENINGS AND GROWTH RATES
Understanding the difference between employment openings and growth rates helps you understand why there will be more openings for secretaries, for example, than for aerospace engineers, despite the fact that clerical work is threatened by technology and the high-tech sector has above-average growth rates.

EMPLOYMENT OPENINGS: WHAT PRODUCES EMPLOYMENT?
Economic growth is the engine that powers the expansion of many fields. The other employment producer is the need to replace workers who retire or die. Growth and replacement together influence the future employment picture so the total number of openings projected is based on these two factors:

- **openings resulting from economic growth**
- **openings resulting from retirement or death**

In many occupations there will be as many (or more) employment openings due to replacement needs as to economic growth. What this means is that even occupational fields with little or no employment growth or slower than average growth may offer many employment openings.

At this time, COPS (Canadian Occupational Projection System) includes only retirement and death in replacement estimates, not turnover (transferring to other employment). Not being able to include turnover in the projections means that in sectors like tourism, which are known for their high turnover, COPS will likely under-estimate the number of openings due to replacement needs.

GROWTH RATES
The projected growth of an occupation is usually reported as an average annual percent change, with an occupation described as having an above- or below-average growth rate. However, because increases in occupations are in large part determined by the size of the existing workforce, a high or above-average rate of growth in a small occupation doesn't necessarily mean that the growing field will offer a large number of openings.

This is the paradox of the labour market in the "New Economy." Despite the higher-than-average projected growth for "knowledge workers" such as aerospace engineers, the number of openings produced by these occupational groups will be much lower in number than many of the "low-tech" openings in sales and service. What this means is that large occupational groups with below-average growth can still produce more openings than small occupational groups with high growth.

While increases in the total number of openings is probably the most useful number for career planning, it is important to be aware that a high growth rate is often a signal of new emerging fields that will sustain growth and provide career opportunities for many years to come.

For technical information on COPS, see pages 590 to 595.

- ***Narrative Information***
  Although the numerical projections used in *Work Futures* are based on the best judgment of specialists using the most sophisticated forecasting tools available, it is best to use the numbers as parameters (i.e. ranges or general indicators) of employment prospects. The greatest strength of *Work Futures* is the descriptive analysis of information gathered from representatives of industry, labour, governments and education on the employment prospects in each occupational group.

The more you can learn about the kinds of issues that impact occupational growth and decline, the more easily you will be able to make career decisions. In particular, it is important to understand how the following labour market trends can combine to influence employment opportunities (for more information, see *Using Labour Market Information* in section 2, *Choosing A Career*):

- innovations in technology
- the globalization of trade
- sector/industry shifts
- demographic changes/aging population
- government policies/reduced spending
- changing business practices
- changing consumer demand

In addition to discussing the implications of the above trends on employment opportunities, the **Employment Prospects** section may also describe desirable employment characteristics and possible career paths. Also identified in this section is the degree of competition for work that applicants are likely to encounter. For example, does the occupation attract many more jobseekers than there are openings to be filled? Do opportunities vary by industry, size of firm or geographic location?

Additional Information

This section lists Internet addresses that might be useful.

Related Occupations

This section can help identify other occupations that involve similar aptitudes and interests.

- ***Sensitivity to Business Cycles and Seasonal Factors***
  It is important to know if employment in an occupation is usually stable, or if periods of inactivity can be expected. For example, occupations which may be among the quickest to decline during an economic slowdown may also be among the first to rebound during a recovery. These occupations are said to be sensitive to business conditions and this is noted where applicable.

- ***Top Industry Sectors***
  Knowing what kind of firms or organizations employ most of the workers in an occupational group can help in starting a job search. Once you know the top industries that hire, you can seek out specific companies or organizations in the industry by looking in the Yellow Pages or asking for an appropriate directory at your local library. Concentrating on the industries which are most likely to hire workers in a given occupation can increase the chances of a faster, more successful job search.

- ***Size of the Occupation***
  Information about the size of the occupational group and recent employment trends from 1990 to 1998 are given. Knowing the size of an occupational group will give you a sense of several dimensions of the occupation. For example, large occupations generally have more replacement (attrition and turnover) openings than small occupations.

Employment Prospects

This section contains information on future labour market demand conditions for the occupation and the factors that affect them. This information is presented in both statistical and narrative format.

- ***Numerical Projections***
  Projections are from the Canadian Occupational Projection System (COPS) and include:
  - the average annual percent change in the number of people working in the occupation between 1998 and 2008.
  - the number of openings projected over the 1998 to 2008 period, including both the number created as a result of growth in the economy (net growth) as well as those expected as a result of retirement or death.

The COPS projections in *Work Futures* are for the province of B.C. as a whole. It may be that opportunities in your region or community will be better or worse than those described here.

No one can foresee the future

Although the numerical projections used in *Work Futures* are based on the best judgment of specialists using the most sophisticated forecasting tools available, please use the estimates and projections in *Work Futures* with caution. It is best to use the numbers as guidelines.

Labour market conditions and economic conditions change so quickly these days that no one should make occupational or educational decisions based only on the predicted demand for the occupation. The most useful part of *Work Futures* is the descriptive (narrative) information about occupations and the labour market. This material was gathered from experts in industry, labour, government and education and offers an up-to-date picture of each occupational group.

In this new world of work, the question, "Where will the jobs be?" doesn't apply any more. A better question to ask for the changing labour market is, "What am I good at and where will the opportunities be for me to apply my special skills and knowledge?"

The projections are based on a set of assumptions about how the economy is likely to change between 1998 and 2008. It is important for readers to note that continuing globalization, technological developments and political, social and economic change make accurate forecasting difficult. Please use these estimates and projections with caution.

It is also important to note that the COPS projections of ***employment demand*** (the estimated number of openings) do not consider ***employment supply*** (the number of individual workers who are available to fill those employment demands). Therefore, the projections used in *Work Futures* are simply projections of employment demand, and are not forecasts of shortages and surpluses of workers for particular occupational groups.

Whenever possible, information from industry, labour, government and education on current or projected surpluses or shortages of workers in an occupation is given. A shortage or oversupply of qualified and available workers will affect the competitiveness of the job market for a given occupation. When there are surpluses of workers, applicants may have to search for a longer time, accept a less desirable offer, find employment in another occupation, or face extended unemployment.

+0 +P

20% What the Numbers Mean !#*?

EMPLOYMENT OPENINGS AND GROWTH RATES

Understanding the difference between employment openings and growth rates helps you understand why there will be more openings for secretaries, for example, than for aerospace engineers, despite the fact that clerical work is threatened by technology and the high-tech sector has above-average growth rates.

EMPLOYMENT OPENINGS: WHAT PRODUCES EMPLOYMENT?

Economic growth is the engine that powers the expansion of many fields. The other employment producer is the need to replace workers who retire or die. Growth and replacement together influence the future employment picture so the total number of openings projected is based on these two factors:

- **openings resulting from economic growth**
- **openings resulting from retirement or death**

In many occupations there will be as many (or more) employment openings due to replacement needs as to economic growth. What this means is that even occupational fields with little or no employment growth or slower than average growth may offer many employment openings.

At this time, COPS (Canadian Occupational Projection System) includes only retirement and death in replacement estimates, not turnover (transferring to other employment). Not being able to include turnover in the projections means that in sectors like tourism, which are known for their high turnover, COPS will likely under-estimate the number of openings due to replacement needs.

GROWTH RATES

The projected growth of an occupation is usually reported as an average annual percent change, with an occupation described as having an above- or below-average growth rate. However, because increases in occupations are in large part determined by the size of the existing workforce, a high or above-average rate of growth in a small occupation doesn't necessarily mean that the growing field will offer a large number of openings.

This is the paradox of the labour market in the "New Economy." Despite the higher-than-average projected growth for "knowledge workers" such as aerospace engineers, the number of openings produced by these occupational groups will be much lower in number than many of the "low-tech" openings in sales and service. What this means is that large occupational groups with below-average growth can still produce more openings than small occupational groups with high growth.

While increases in the total number of openings is probably the most useful number for career planning, it is important to be aware that a high growth rate is often a signal of new emerging fields that will sustain growth and provide career opportunities for many years to come.

For technical information on COPS, see pages 590 to 595.

- ***Narrative Information***
  Although the numerical projections used in *Work Futures* are based on the best judgment of specialists using the most sophisticated forecasting tools available, it is best to use the numbers as parameters (i.e. ranges or general indicators) of employment prospects. The greatest strength of *Work Futures* is the descriptive analysis of information gathered from representatives of industry, labour, governments and education on the employment prospects in each occupational group.

The more you can learn about the kinds of issues that impact occupational growth and decline, the more easily you will be able to make career decisions. In particular, it is important to understand how the following labour market trends can combine to influence employment opportunities (for more information, see *Using Labour Market Information* in section 2, *Choosing A Career):*

- innovations in technology
- the globalization of trade
- sector/industry shifts
- demographic changes/aging population
- government policies/reduced spending
- changing business practices
- changing consumer demand

In addition to discussing the implications of the above trends on employment opportunities, the **Employment Prospects** section may also describe desirable employment characteristics and possible career paths. Also identified in this section is the degree of competition for work that applicants are likely to encounter. For example, does the occupation attract many more jobseekers than there are openings to be filled? Do opportunities vary by industry, size of firm or geographic location?

Additional Information

This section lists Internet addresses that might be useful.

Related Occupations

This section can help identify other occupations that involve similar aptitudes and interests.

Key Phrases Used in *Work Futures*

Occupational Growth Rates Between 1998 and 2008

If the statement reads..	*Employment is projected to...*
Grow much faster than the average	Increase 2.4% or more annually
Grow faster than the average	Increase 1.9% to 2.3% annually
Grow about as fast as the average	Increase 1.4% to 1.8% annually
Little change or grow more slowly than the average	Increase 0% to I.3% annually
Decline	Decrease (0.1%) or more annually

Occupational Size

If the statement reads...	*Estimated employment levels in 1998 total:*
A very large occupational group	10,000 or more
A large occupational group	5,000 to 9,999
A medium occupational group	2,000 to 4,999
A small size occupational group	1,000 to 1,999
A very small occupational group	999 or less

Unemployment

Existing supply of workers compares the 1996 Census unemployment rate in the given occupation with the average unemployment rate for all occupations, which was 9.6%.

If the statement reads...	*The 1996 Census unemployment rate was ...*
Low unemployment in 1996	Lower than 7%
About average unemployment in 1996	From 7% to 11%
High unemployment in 1996	Higher than 11%

What *Work Futures* Can't Do

Work Futures is designed to be used as only one source of career planning information and it does not offer any guarantees about the labour market. Because *Work Futures* gives province-wide information, it cannot provide specific information about occupations in a particular community. For example, wages and working conditions can change sub -stantially for the same occupation around the province. In addition, the information on training requirements may not reflect the exceptions that can exist for every occupation.

The occupational information in *Work Futures* is based on labour market data and information collected between 1990 and 2000. The occupational projections based on this data are for the ten-year period from 1998 to 2008. Remember that these projections aren't guaranteed to happen. No one has a crystal ball into the future. The projections are meant to give you some idea of occupational trends, but you should never make a career decision simply on what jobs are going to be "hot" in the future.

.... And What It Can

Work Futures is the best resource to start with for researching occupations and how they relate to the B.C. labour market. This is your "spring board." From here, you can do more exploration and build on the information you have gathered.

To get the most up-to-date information, you should talk to employers and to people who are working in the occupational area you are interested in. Professional and trade associations, sector councils, libraries, career resource centres, and business publications are all additional sources of occupational information.

You can also learn more about current occupational requirements by reading job postings from companies that hire people in the occupations you are interested in. Reading these job postings will give you an idea of the skill requirements and training that employers expect. Many businesses now post jobs in their web sites which are excellent sources of both company and occupational information.

For more sources that provide occupational information, check out section 4, *General Career Information Resources*.

18

Key Phrases Used in *Work Futures*

Occupational Growth Rates Between 1998 and 2008

If the statement reads..	*Employment is projected to...*
Grow much faster than the average	**Increase 2.4% or more annually**
Grow faster than the average	**Increase 1.9% to 2.3% annually**
Grow about as fast as the average	**Increase 1.4% to 1.8% annually**
Little change or grow more slowly than the average	**Increase 0% to l.3% annually**
Decline	**Decrease (0.1%) or more annually**

Occupational Size

If the statement reads...	*Estimated employment levels in 1998 total:*
A very large occupational group	**10,000 or more**
A large occupational group	**5,000 to 9,999**
A medium occupational group	**2,000 to 4,999**
A small size occupational group	**1,000 to 1,999**
A very small occupational group	**999 or less**

Unemployment

Existing supply of workers compares the 1996 Census unemployment rate in the given occupation with the average unemployment rate for all occupations, which was 9.6%.

If the statement reads...	*The 1996 Census unemployment rate was ...*
Low unemployment in 1996	**Lower than 7%**
About average unemployment in 1996	**From 7% to 11%**
High unemployment in 1996	**Higher than 11%**

What *Work Futures* Can't Do

Work Futures is designed to be used as only one source of career planning information and it does not offer any guarantees about the labour market. Because *Work Futures* gives province-wide information, it cannot provide specific information about occupations in a particular community. For example, wages and working conditions can change substantially for the same occupation around the province. In addition, the information on training requirements may not reflect the exceptions that can exist for every occupation.

The occupational information in *Work Futures* is based on labour market data and information collected between 1990 and 2000. The occupational projections based on this data are for the ten-year period from 1998 to 2008. Remember that these projections aren't guaranteed to happen. No one has a crystal ball into the future. The projections are meant to give you some idea of occupational trends, but you should never make a career decision simply on what jobs are going to be "hot" in the future.

. . . . And What It Can

Work Futures is the best resource to start with for researching occupations and how they relate to the B.C. labour market. This is your "spring board." From here, you can do more exploration and build on the information you have gathered.

To get the most up-to-date information, you should talk to employers and to people who are working in the occupational area you are interested in. Professional and trade associations, sector councils, libraries, career resource centres, and business publications are all additional sources of occupational information.

You can also learn more about current occupational requirements by reading job postings from companies that hire people in the occupations you are interested in. Reading these job postings will give you an idea of the skill requirements and training that employers expect. Many businesses now post jobs in their web sites which are excellent sources of both company and occupational information.

For more sources that provide occupational information, check out section 4, *General Career Information Resources*.

Internet Resources for Occupational Information

Work Futures: http://workfutures.bc.ca

This edition of *Work Futures* can be found on the Internet in a user-friendly format which is easy to understand and navigate.

WorkScene: http://workinfonet.bc.ca/workscene

WorkScene offers B.C.-based occupational profiles designed especially for youth and individuals with lower literacy skills. The profiles are shorter than those in *Work Futures* and written in plainer language.

Job Futures: http://www.hrdc-drhc.gc.ca/JobFutures

***Job Futures* is similar to *Work Futures*, but offers occupational information for the Canadian labour market as a whole.**

Industry Training and Apprenticeship Commission: http://www.itac.gov.bc.ca

Produced by the provincial government, this site provides information about the apprenticeship and trade certification system in B.C.

Daily Career News: http://workinfonet.bridges.com

This site offers up-to-date occupational profiles that change each day. The information isn't archived, so many career centres download the information daily.

Work Destinations: A Guide to Relocation and Work in Canada: http://www.workdestinations.org

Designed for Canadians who want to practice their trade or profession in other provinces and territories, this site offers information about regulated occupations across the country.

Essential Skills Profiles Database: http://www15.hrdc-drhc.gc.ca

This site gives an overview of the HRDC Essential Skills Project and describes essential skills for 170 occupations.

> ***"Every calling is great when greatly pursued."***
>
> *- Ralph Waldo Emerson*

+8

2. CHOOSING A CAREER

This section provides some guidelines that you can use to increase the quality of your career decisions. Some career experts are predicting that people can expect to change their careers from seven to nine times in their working lives. Given this reality, the most important thing for you to learn is the process of how to make meaningful career decisions. If you learn effective career development skills, you will have a much better chance of thriving in this new world of work!

What is Career Development?

"Career development is about growing through life and work; about learning, experiencing, living, working and changing; about creating and discovering pathways through one's life and work."- *The Blueprint for Life/Work Designs.*

In our rapidly changing world, the definition of "career" is changing. When it is done consciously, career development is about actively creating the life you want to live and the work you want to do; it is a continuous process throughout life. "Career" no longer refers to particular pathways through work or to an occupational title. Everyone has a career. Work and life are intertwined, and the boundaries between the two are blurring.

Planning a Career for the New Economy

In the last 20 years, the world of work has dramatically changed how people earn their living and plan their work lives. This new labour market is evolving at accelerating speed as old industrial-age jobs are replaced by knowledge-based work, and information technology continues to alter how we work, play and learn. This dramatic change in how goods and services are produced and distributed has been labeled the "New Economy." The old economy was based on resources; the New Economy is based on knowledge and is driven by technology and information.

Working in new ways: In this New Economy, new forms of work are being created, as employment in a "job-for-life" is replaced by a variety of "work alternatives." These work alternatives can include working part time, contracting, consulting or owning a business where you hire your own employees.

In British Columbia, more and more people are working in this way, and economists are predicting that this trend will continue in the future. Career counsellors are encouraging people to prepare for these work alternatives rather than for just a full-time job. Workers will need to develop new skills to market themselves in this dynamic world of work.

New thinking for a new millennium: The New Economy demands that we change our thinking about the labour market. As Yogi Berra said, "The future isn't what it used to be." Traditional job patterns that we took for granted for most of the last century have disappeared. Letting go of the way things used to be in the world of work is one of the hardest challenges that career planners face today. Here are some trends which all workers will have to adapt to:

Change: Rapid change will be constant in the workplace of the new millennium. Those who understand change and can manage it effectively will be more successful.

Just-in-time training: In the information economy, it is impossible to learn everything you need to know ahead of time to do a job. Rapid learning will be commonplace. The advantage will go to those who can learn - and instruct - the fastest. Workers must commit to continuous learning throughout their life/work.

Fusion: Job classifications and occupational titles will become less important. The jobs of the future will be hyphenated; in other words, there will be a fusion of titles like carpenter-architect, accountant-sales rep, or graphic designer-webmaster. Being able to combine a variety of skills to apply to a particular task will be increasingly important.

Self-reliance: Work is becoming more "entrepreneurial" in the sense that workers have to be prepared for a variety of work alternatives and take the initiative to market their skills more creatively. As a result, people will need to be more responsible for their own career development. The notion of "career self-management" is emerging as a means not only of surviving in the New Economy, but also of thriving and making the best of its new opportunities.

Emphasis on skills: Workers can no longer expect long-term job security, but what they can and should rely on is "skills security." If workers keep their skills up to date and market them effectively in areas of the economy that are growing, they will be able to find work. An essential ingredient of career self-management is knowing and developing skill sets and then finding areas of work where they can be applied. The next chapter, *Developing Skills for Today's Workplace*, offers information about what these skills are and some steps about how to identify and develop them.

Balance in life/work: Information technology is fueling the accelerating pace of change. We are "plugged in" to work more than ever before through communications (e-mail, phone, fax, pagers, the Internet). To maintain

11

their health and well-being, workers will have to rethink how and where they work and find balance between earning a living and living their lives.

Finding opportunity: In this New Economy, the rewards will go to people who can use their creativity to find new opportunities where they can apply their skills and abilities. This ability means keeping an open mind about where and how you work. It means seeing what is familiar with "new eyes."

The New Economy is very different from the old, and offers even more opportunities to find challenging, rewarding and satisfying work. If you spend time and energy planning for this new reality, you will be able to create a career plan that offers excitement, anticipation and hope for the future.

Using the Internet for Career Development

In the past few years, the Internet has become an essential research and work search tool. Most government resources related to career and labour market information are now on the Internet, including this publication. In addition, companies, all levels of government, and the non-profit sector are starting to recruit employees through their websites.

As an example, Nortel, one of Canada's largest high tech companies, posts jobs only on its website and expects prospective employees to apply online. In this global marketplace, people are also using the Net to find work all over the world. An essential skill for New Economy workers is the ability to use the Internet for researching information, finding job postings, and managing their careers.

There are literally thousands of career-related resources on the Internet today. In the next few sections, you will find lists of Internet resources that you can use for all phases of your career development. Take some time to explore them, and harness the power of the Internet to help you design your life/work. In addition, be sure to check out B.C. WorkInfoNet which is B.C.'s electronic gateway to up-to-date career and labour market information. See the textbox for more information.

Getting Started with Planning Your Career

The rest of this chapter will describe in more detail the three steps involved in the career planning process:

1. Self-assessment
2. Using labour market information
3. Making decisions and managing your career

The information below will help you understand what each step of career planning involves and give you guidance and resources that will you help continue with your exploration and decision-making.

B.C. WorkInfoNet

Your One-Stop Source of Career and Labour Market Information http://workinfonet.bc.ca

The B.C. WorkInfoNet website is a gateway for British Columbians to access online career planning, job search and labour market information resources. Users can customize their information searches with unique user tabs, link to over 1,500 current websites and explore a variety of comprehensive career and job search tools and resources. The site includes an easy-to-use tutorial to help British Columbians conduct online job searches.

The B.C. WorkInfoNet Youth Website (http://workinfonet.bc.ca/youth) provides a gateway for B.C. youth aged 15 to 29 to access online career planning, job search and labour market information resources. The Youth Site is developed with input from B.C. youth and includes a dynamic webzine with articles written by B.C. youth, a directory of current youth resources and tools, and a Facilitator's Guide for educators and career practitioners to use the Youth Site in their learning environments.

Choosing A Career: Step 1 - Self-Assessment

> ***"Only by knowing yourself will you be able to make the right decisions about your career - decisions that reflect your most important personal values and concerns, rather than being driven by external measures of success such as status or income."***
>
> *- Barbara Moses, Career Intelligence.*

Know thyself: This ancient wisdom applies today more than ever in relation to career development. Self-assessment is the first step in career decision-making. It means learning about your interests, values, goals, aptitudes and skills. What you learn through self-assessment will help you to lay the groundwork for identifying the kinds of work you will find most rewarding.

their health and well-being, workers will have to rethink how and where they work and find balance between earning a living and living their lives.

Finding opportunity: In this New Economy, the rewards will go to people who can use their creativity to find new opportunities where they can apply their skills and abilities. This ability means keeping an open mind about where and how you work. It means seeing what is familiar with "new eyes."

The New Economy is very different from the old, and offers even more opportunities to find challenging, rewarding and satisfying work. If you spend time and energy planning for this new reality, you will be able to create a career plan that offers excitement, anticipation and hope for the future.

Using the Internet for Career Development

In the past few years, the Internet has become an essential research and work search tool. Most government resources related to career and labour market information are now on the Internet, including this publication. In addition, companies, all levels of government, and the non-profit sector are starting to recruit employees through their websites.

As an example, Nortel, one of Canada's largest high tech companies, posts jobs only on its website and expects prospective employees to apply online. In this global marketplace, people are also using the Net to find work all over the world. An essential skill for New Economy workers is the ability to use the Internet for researching information, finding job postings, and managing their careers.

There are literally thousands of career-related resources on the Internet today. In the next few sections, you will find lists of Internet resources that you can use for all phases of your career development. Take some time to explore them, and harness the power of the Internet to help you design your life/work. In addition, be sure to check out B.C. WorkInfoNet which is B.C.'s electronic gateway to up-to-date career and labour market information. See the textbox for more information.

Getting Started with Planning Your Career

The rest of this chapter will describe in more detail the three steps involved in the career planning process:

1. Self-assessment
2. Using labour market information
3. Making decisions and managing your career

The information below will help you understand what each step of career planning involves and give you guidance and resources that will you help continue with your exploration and decision-making.

B.C. WorkInfoNet

Your One-Stop Source of Career and Labour Market Information *http://workinfonet.bc.ca*

The B.C. WorkInfoNet website is a gateway for British Columbians to access online career planning, job search and labour market information resources. Users can customize their information searches with unique user tabs, link to over 1,500 current websites and explore a variety of comprehensive career and job search tools and resources. The site includes an easy-to-use tutorial to help British Columbians conduct online job searches.

The B.C. WorkInfoNet Youth Website (*http://workinfonet.bc.ca/youth*) provides a gateway for B.C. youth aged 15 to 29 to access online career planning, job search and labour market information resources. The Youth Site is developed with input from B.C. youth and includes a dynamic webzine with articles written by B.C. youth, a directory of current youth resources and tools, and a Facilitator's Guide for educators and career practitioners to use the Youth Site in their learning environments.

Choosing A Career: Step 1 - Self-Assessment

"Only by knowing yourself will you be able to make the right decisions about your career - decisions that reflect your most important personal values and concerns, rather than being driven by external measures of success such as status or income."

- Barbara Moses, Career Intelligence.

Know thyself: This ancient wisdom applies today more than ever in relation to career development. Self-assessment is the first step in career decision-making. It means learning about your interests, values, goals, aptitudes and skills. What you learn through self-assessment will help you to lay the groundwork for identifying the kinds of work you will find most rewarding.

σ +8

Expect to work hard: Self-assessment is the most important part of career planning and also the hardest. Most of us want a fast and easy way of choosing a career or occupation. Many people flip through a college calendar and pick a program that looks interesting. Unfortunately, some discover that after devoting precious time and money pursuing the choice, it isn't personally fulfilling or satisfying!

If you want to make an informed career choice, there are no shortcuts. But the payoff to spending time in career decision-making is worthwhile. People who spend time learning about themselves in relation to the world of work usually have the most satisfying and successful careers.

Also remember that this step of the career planning process is particularly important in the current labour market. As the winds of change whirl around all of us, the only constant you have is your own sense of direction and purpose. Knowing who you are and where you want to go in the midst of these chaotic times will serve you well.

Follow your heart: The place to start with self-assessment is to focus on asking yourself what you care about most. What do you love to do? What are you proud of in your life? How do those values and accomplishments relate to the world of work? People who work from a sense of passion and commitment are usually the happiest in their careers.

Get help: Self-assessment is difficult to do on your own. You should use as many resources as you can find to help you: Internet resources in this publication, self-help books from your local library, and career planning courses in your community. Career counsellors in schools and post-secondary institutions can offer assistance to students, and private career counsellors work with clients individually to help them with career change; look in the Yellow Pages under *Counsellors* and *Career and Vocational Counselling*.

Take courses: Most communities offer short-term career planning and work search courses. Doing career planning in a group setting is very useful to help you learn about your career strengths. Check out your local community college, school district, YM/YWCA, and Human Resources Canada Centres (HRCCs) for information about career planning courses.

Assess your skills: One of the most important parts of self-assessment is identifying your employability skills. As "skills security" replaces "job security," it is essential that workers be able to identify their skills and be able to talk about them with confidence. See the next chapter on *Developing Skills for Today's Workplace* for more information.

Talk to others: Don't forget to talk with friends and family and ask about the kind of work they think you would be good at. Ask them to make a list of the skills and abilities they think you possess. Talk to people who are passionate about what they do and ask them what brings them satisfaction in their work.

Redefine success: Career success in the old economy included job security, a big benefit package, promotions, pay raises and climbing the corporate ladder. Since long-term job security no longer exists, you need to rethink what career success means to you. A new definition of success can be based on proving your worth that comes from your own standards and expectations, rather than those of others. For many people, a successful career includes not only rewarding work, but also emotional, mental, physical and spiritual well being.

Keep a journal to record your journey towards self-discovery: Get into the habit of keeping a record of your career exploration activities and reflections. In the Making Decisions and Managing Your Career section on page 19, you will be introduced to the career portfolio concept. Keeping records of career planning activities in your career portfolio will help you every time you have to "redesign" your life/work and change your career direction.

Use a variety of resources: Check out the chapter on *General Career Information Resources* on page 32. Here you will find other sources of career information that will help you with the self-assessment process.

"Identifying your lifework is no longer an escapist fantasy It is a condition for being successful. You now have to discover your lifework if you are to have a chance of creating a satisfactory and satisfying work life."

- William Bridges, Creating You & Co.

Internet Resources for Self-Assessment

Worksearch:
http://worksearch.gc.ca
A career planning resource from the Government of Canada. Click on "Knowing Yourself" for help in identifying skills, exploring interests, identifying values and assessing aptitudes.

Career Planning for Students and Parents:
http://www.bc.ed.gov.bc.ca/careers/planning/plan/aware.htm
Produced by the B.C. Ministry of Education, this resource offers a step-by-step "Career Awareness Process" to help students and parents with self-assessment for career planning.

Career Paths:
http://careerpathsonline.com
Click on "The 10-Step Career Planning Guide" for help with learning about your values, personality, learning style, skills and interests.

Canada Prospects:
http://www.careerccc.org/english/showcase/index_e.htm
The Canada Career Consortium produces this annual tabloid filled with tips, interviews and useful career-related information. Section 1 of the 1999-2000 edition offers resources to help with self-assessment in relation to the labour market.

TypeFocus:
http://typefocus.com/free
An online personality questionnaire that links personality type to occupational preference. The code generated is similar to the Myers Briggs Type Indicator (MBTI) tool.

Keirsey Temperament Sorter:
http://keirsey.com
An online personality questionnaire which results in a personality type code similar to the Myers Briggs Type Indicator (MBTI). Gives descriptions of each personality type. This is a US site.

Ideal Life Style Inventory:
http://www.bgsu.edu/offices/careers/process/exercise.html
An online resource which helps you assess the "lifestyle" aspect of your career goals. Note this is a US site.

Self-assessment on the Internet: Proceed with caution!
Although these online resources are useful to help you get started with self-assessment, it is wise to use them only as a supplement to other activities. The Internet is a powerful tool, but so far its interactive abilities are minimal. The self-assessment you do on the Internet won't give you a complete picture of your interests, values, skills and abilities. You need to engage in a variety of activities to answer the question of who you are in relation to the world of work.

Choosing a Career: Step 2 - Using Labour Market Information

> ***"More and more individuals can expect to take on greater responsibility for researching, analyzing and using their own labour market information. This will be increasingly necessary in a world in which information is growing at an exponential rate."***
>
> *- New Directions in LMI,*
> *Ministry of Advanced Education, Training and Technology*

What is labour market information?

In order to find the work that's right for you, you need to combine the knowledge you gather from your self-assessment activities with information about the labour market. Labour market information (LMI) is information about the world of work. The traditional definition of LMI refers to descriptive and statistical information about occupations, wage rates, unemployment rates, employment outlooks, education and training, and economic trends and conditions.

However, as LMI is becoming more essential to career development, its definition has expanded. LMI now refers to any information that is used for labour market-related planning and decision-making. This is an important change because it recognizes that LMI is part of the career planning process. As work and life become more intertwined, information about how the labour market works should be part of every stage of career planning.

Understanding the economy

Information about how the economy works is a major part of LMI. Developing *economic literacy* means learning about basic economic principles and terms and understanding how economic trends affect the labour market. As the world becomes more complex, you need to know about the economy so that you can more easily identify where there will be work opportunities.

The best place to start learning about the provincial economy is to use the provincial publication called *A Guide to the B.C. Economy and Labour Market*. Have a look at the textbox for more information about this useful resource.

Internet Resources for Self-Assessment

Worksearch:
http://worksearch.gc.ca
A career planning resource from the Government of Canada. Click on "Knowing Yourself" for help in identifying skills, exploring interests, identifying values and assessing aptitudes.

Career Planning for Students and Parents:
http://www.bc.ed.gov.bc.ca/careers/planning/plan/aware.htm
Produced by the B.C. Ministry of Education, this resource offers a step-by-step "Career Awareness Process" to help students and parents with self-assessment for career planning.

Career Paths:
http://careerpathsonline.com
Click on "The 10-Step Career Planning Guide" for help with learning about your values, personality, learning style, skills and interests.

Canada Prospects:
http://www.careerccc.org/english/showcase/index_e.htm
The Canada Career Consortium produces this annual tabloid filled with tips, interviews and useful career-related information. Section 1 of the 1999-2000 edition offers resources to help with self-assessment in relation to the labour market.

TypeFocus:
http://typefocus.com/free
An online personality questionnaire that links personality type to occupational preference. The code generated is similar to the Myers Briggs Type Indicator (MBTI) tool.

Keirsey Temperament Sorter:
http://keirsey.com
An online personality questionnaire which results in a personality type code similar to the Myers Briggs Type Indicator (MBTI). Gives descriptions of each personality type. This is a US site.

Ideal Life Style Inventory:
http://www.bgsu.edu/offices/careers/process/exercise.html
An online resource which helps you assess the "lifestyle" aspect of your career goals. Note this is a US site.

Self-assessment on the Internet: Proceed with caution!
Although these online resources are useful to help you get started with self-assessment, it is wise to use them only as a supplement to other activities. The Internet is a powerful tool, but so far its interactive abilities are minimal. The self-assessment you do on the Internet won't give you a complete picture of your interests, values, skills and abilities. You need to engage in a variety of activities to answer the question of who you are in relation to the world of work.

Choosing a Career: Step 2 - Using Labour Market Information

> ***"More and more individuals can expect to take on greater responsibility for researching, analyzing and using their own labour market information. This will be increasingly necessary in a world in which information is growing at an exponential rate."***
>
> *- New Directions in LMI,*
> *Ministry of Advanced Education, Training and Technology*

What is labour market information?

In order to find the work that's right for you, you need to combine the knowledge you gather from your self-assessment activities with information about the labour market. Labour market information (LMI) is information about the world of work. The traditional definition of LMI refers to descriptive and statistical information about occupations, wage rates, unemployment rates, employment outlooks, education and training, and economic trends and conditions.

However, as LMI is becoming more essential to career development, its definition has expanded. LMI now refers to any information that is used for labour market-related planning and decision-making. This is an important change because it recognizes that LMI is part of the career planning process. As work and life become more intertwined, information about how the labour market works should be part of every stage of career planning.

Understanding the economy

Information about how the economy works is a major part of LMI. Developing *economic literacy* means learning about basic economic principles and terms and understanding how economic trends affect the labour market. As the world becomes more complex, you need to know about the economy so that you can more easily identify where there will be work opportunities.

The best place to start learning about the provincial economy is to use the provincial publication called *A Guide to the B.C. Economy and Labour Market*. Have a look at the textbox for more information about this useful resource.

A Guide to the B.C. Economy and Labour Market

Http://workinfonet.bc.ca/lmisi/bc-econ/econdoc.html

"If you're planning to work in British Columbia, you need to know what kinds of jobs are available in the province, which industries are hiring new workers, and where you're likely to find an employer who needs someone with your skills and abilities. You should also know how B.C.'s economy is structured, which industries employ the most people, how the economy has been changing, and how it's expected to change in the future."

This key LMI publication provides in one source an engaging and understandable overview of the provincial economy for non-economists. Find it on the Internet (URL above); or to order a print copy, go to the website for *What's Key in Labour Market Information in B.C.* to find ordering details: http://workinfonet.bc.ca/LMISI/WhatsKey

The importance of self-reliance

Given the economic forces working today, the labour market changes very quickly, and individuals have to have the skills to respond to those changes. Every time you want to find new work opportunities or change career direction, you will have to use LMI. Being able to gather, analyse and apply labour market information on your own is an important skill for successful career management.

There is so much LMI available. You can find literally thousands of websites, publications, studies, and books about the economy and the labour market. We are swimming in a sea of labour market information. With so many possibilities, individuals have to learn to navigate through all the possibilities and chart their own course based on their own needs.

Research skills are the key

Learning how to research the labour market is the key to finding the information you need and applying it your particular life/work goals. Here's a process you can use:

- Identify the areas that have an impact on and describe the labour market.
- Find the appropriate sources of labour market information and gather facts related to each area.
- Analyse what the facts mean and then apply them to your career planning process.

How to research labour market information

This section will help you identify some of the major areas that relate to the labour market and give you questions to help you with your research. The areas of the labour market that this section covers are:

- Globalization
- Technology
- Demographics
- Occupational LMI
- Education & Training LMI
- Industry/Sector LMI
- Community LMI

Globalization

> *"Globalization and technology go hand-in-hand. Globalization unleashes technology, which in turn drives firms to plan production and sales on a global basis. Technology changes the work we do and in nearly all cases, the jobs created by it demand more education and training."*
>
> *- David Ross,*
> *Family Security in Insecure Times.*

With globalization, investment is easily moved across borders. International corporations and small businesses participate in a global marketplace where everyone is potentially a customer or a competitor. International economic and trade agreements and alliances also continue to reduce barriers to trade and investment.

Although many people disagree with the inevitability of globalization and worry about its effects on the autonomy of national economies, the reality remains that workers must understand how these forces affect their opportunities for making a living.

Research topics:

- How does globalization affect the community where you want to work? What companies are doing business in the global market place?
- What does it take for these companies to compete globally?
- What skills do you need to be able to work for these employers?
- What is the impact of globalization on your community? on you?

Technology

Technology has a profound and continuous impact on the labour market in terms of how goods and services are produced and distributed. The application of technology in the labour market is constantly creating new occupations and new ways of working. It will continue to be a major influence in all areas of our lives.

Research topics:

- How is technology affecting your daily life?
- How is technology (e.g. computers and telecommunications) affecting the area of work you are interested in?
- Do you have the computer skills that are required for the work you want to do?

A Guide to the B.C. Economy and Labour Market

Http://workinfonet.bc.ca/lmisi/bc-econ/econdoc.html

"If you're planning to work in British Columbia, you need to know what kinds of jobs are available in the province, which industries are hiring new workers, and where you're likely to find an employer who needs someone with your skills and abilities. You should also know how B.C.'s economy is structured, which industries employ the most people, how the economy has been changing, and how it's expected to change in the future."

This key LMI publication provides in one source an engaging and understandable overview of the provincial economy for non-economists. Find it on the Internet (URL above); or to order a print copy, go to the website for *What's Key in Labour Market Information in B.C.* to find ordering details: http://workinfonet.bc.ca/LMISI/WhatsKey

The importance of self-reliance

Given the economic forces working today, the labour market changes very quickly, and individuals have to have the skills to respond to those changes. Every time you want to find new work opportunities or change career direction, you will have to use LMI. Being able to gather, analyse and apply labour market information on your own is an important skill for successful career management.

There is so much LMI available. You can find literally thousands of websites, publications, studies, and books about the economy and the labour market. We are swimming in a sea of labour market information. With so many possibilities, individuals have to learn to navigate through all the possibilities and chart their own course based on their own needs.

Research skills are the key

Learning how to research the labour market is the key to finding the information you need and applying it your particular life/work goals. Here's a process you can use:

- Identify the areas that have an impact on and describe the labour market.
- Find the appropriate sources of labour market information and gather facts related to each area.
- Analyse what the facts mean and then apply them to your career planning process.

How to research labour market information

This section will help you identify some of the major areas that relate to the labour market and give you questions to help you with your research. The areas of the labour market that this section covers are:

- Globalization
- Technology
- Demographics
- Occupational LMI
- Education & Training LMI
- Industry/Sector LMI
- Community LMI

Globalization

> *"Globalization and technology go hand-in-hand. Globalization unleashes technology, which in turn drives firms to plan production and sales on a global basis. Technology changes the work we do and in nearly all cases, the jobs created by it demand more education and training."*
>
> *- David Ross,*
> *Family Security in Insecure Times.*

With globalization, investment is easily moved across borders. International corporations and small businesses participate in a global marketplace where everyone is potentially a customer or a competitor. International economic and trade agreements and alliances also continue to reduce barriers to trade and investment.

Although many people disagree with the inevitability of globalization and worry about its effects on the autonomy of national economies, the reality remains that workers must understand how these forces affect their opportunities for making a living.

Research topics:

- How does globalization affect the community where you want to work? What companies are doing business in the global market place?
- What does it take for these companies to compete globally?
- What skills do you need to be able to work for these employers?
- What is the impact of globalization on your community? on you?

Technology

Technology has a profound and continuous impact on the labour market in terms of how goods and services are produced and distributed. The application of technology in the labour market is constantly creating new occupations and new ways of working. It will continue to be a major influence in all areas of our lives.

Research topics:

- How is technology affecting your daily life?
- How is technology (e.g. computers and telecommunications) affecting the area of work you are interested in?
- Do you have the computer skills that are required for the work you want to do?

- Can you use the Internet, e-mail, phone and fax effectively?
- Are you prepared to commit to continuous learning to keep up with changes in technology?

Demographics

Demographics is the study of human populations. Knowing about population trends can help career planners predict where work opportunities will develop. Canadian demographer, David Foot, believes that a demographic approach to career planning always involves analyzing the needs of the largest segments of the population. He suggests that when it comes to predicting behaviour, the most useful demographic variable is age. His book, *Boom, Bust & Echo 2000*, provides many clues about where employment in the future will be found.

Research topics:

- What is the impact on work opportunities of an aging Baby Boomer (e.g. those born between 1948 and 1966) population?
- What effect is the Echo Generation (born between 1980 and 1995) having on the economy?
- What are the population characteristics of the community where you want to work? Is the population increasing or decreasing? What is the age and gender distribution? What is the rate of immigration?
- What does this information mean for the demand for goods and services and for work opportunities?

Occupational Information

Occupational labour market information is important for people who are making career decisions, whether they are high school students planning their first career or mid-life career changers. *Work Futures* is a key resource to help you learn about occupations. Other sources of occupational information are listed in section 1, the *How-To-Use Guide.*

Remember that LMI related to wages, working conditions, vacancy and employment opportunities can vary a great deal regionally, provincially and nationally, so it's important to research occupations in the community where you are interested in working.

Research topics:

- What kind of work and fields of study interest you?
- What skills and education do you need for the occupation, and what programs are available?
- What occupation(s) does this field of study qualify you for? What is the existing and expected employment opportunities overall for these occupation(s)?
- What are the wages, working conditions? What are the skills and experience requirements expected by employers?
- How can you maximize your chances relative to others? (volunteer work, co-op work)
- What are the opportunities for self-employment?

Education & Training Information

Information about education and training opportunities is important for everyone in a workplace that requires continuous learning. When choosing a training program, prospective students need to consider many issues.

Research topics:

- What is the difference between "education" and "training"?
- What is the difference between the various types of public post-secondary institutions in B.C.?
- What is the difference between public and private post-secondary institutions?
- What are the cost/benefits of the program you are considering?
- What kind of credential or certification will you receive from the institution?
- What programs and services are available to help you finance your education?
- Can you get credit for any prior learning (i.e. learning acquired in non-formal settings)?
- Can you work and study at the same time? Is the program available by distance education?

Another important aspect of Education & Training LMI is the experience that former students and graduates had in their post-secondary programs. Check out section 3, *Developing Skills for Today's Workplace* for information on student outcomes and graduate follow-up surveys.

Industry/Sector Information

An industry is as a group of businesses that produce similar products and/or services. For your research purposes, assume that the word "industry" means the same as the word "sector." Examples of economic industries are Tourism, Health Care, Forestry, Culture and Entertainment.

There is a difference between occupations and industries. There are many industries that make up the economy, and each industry is made up of a variety of occupations. Note that an occupation is **what** a person does, while an industry or sector is **where** a person performs that occupation. As an example, nursing is the kind of work (occupational area) nurses do, but they can perform that work in the health care industry (e.g. hospital surgical nurse), in the education industry (e.g. school nurse) or in forestry (occupational health and safety nurse).

There are occupations which are specific to an industry such as miner to mining, but there are also many occupations found in all industries, such as clerical occupations. Perhaps the biggest confusion about the industry/occupation distinction concerns service occupations vs. service industries. Workers in service occupations are not neces-

sarily employed in the service sector. Cooks also find employment in logging camps and sales representatives work for manufacturing firms. But usually, workers in service occupations (cooks) work in a service industry (tourism).

Many occupations are becoming less distinct. To be successful, workers will need to be able to acquire a variety of skill sets that they can apply to a variety of industries. And the skill sets they acquire could cross a variety of occupational areas. For example, a computer programmer may also need to know sales and marketing, plus accounting and finance in order to work in a small high technology firm.

Workers can transfer their skills from one industry to another. Workers in declining sectors can research the labour market to identify growing sectors in which to work. For example, an accountant in the resources sector (declining) would likely find more future opportunities in the tourism sector (growing).

What is most important is knowing your skill sets and how you can apply them in the world of work. Nuala Beck, author *of Excelerate: Growing in the New Economy*, says that it doesn't matter what subject a person studies (or what skills he or she has). ". . . as long as you apply what you've learned in an industry that has a real future in the New Economy." Of course, there is still work to be had in "sunset" or declining sectors, but workers in these sectors need to keep track of trends to be prepared to find new opportunities in other areas if necessary.

Research Topics:

- What are the "sunrise" (growing) industries in the B.C. economy? What are the "sunset" (declining) industries? What is causing the growth/decline?
- How are globalization and technology affecting the industry(s) you are interested in?
- What effect will demographic changes have on the industry?
- What is the history of the industry?
- What is the size of the industry? What is its projected growth?
- Who are the key people/leaders in the industry?
- Who are the major employers?
- What occupations/roles are in demand in the sector?
- Who are the customers/clients the sector serves?
- What involvement does government have in the sector?
- What skills, education and training are expected of workers in the sector?

What's Labour Mobility?

"Labour mobility" refers to the freedom of workers to practise their occupation wherever opportunities exist. Every year, hundreds of thousands of people across Canada relocate to a different province or territory and look for work. Thousands more seek employment outside their home province without relocating. These people—particularly those who work in regulated occupations—sometime face delays, extra costs or other difficulties in having their qualifications recognized when they move across provincial or territorial boundaries. This has the effect of preventing or restricting their labour mobility and their ability to work.

The Agreement on Internal Trade (AIT), which came into effect in 1995, makes it easier for people, goods and services to move across Canada. Chapter 7 of the AIT—the Labour Mobility Chapter—says that any worker qualified for an occupation in one province or territory must be granted access to employment opportunities in that occupation in any other province or territory. This is particularly significant to the 20 percent of Canadians who work in regulated professions (like medicine or engineering) or trades (such as machinists and industrial mechanics (millwrights). Additional information on labour mobility in Canada can be accessed on the Internet at: http://www.hrdc-drhc.gc.ca/stratpol/lmp/mobility/mobility.shtml

As well, an Internet web site has been developed to provide licensing requirements of regulatory bodies in all provinces and territories and other employment and relocation information. Workers can access this information on the Internet at http://www.workdestinations.org

Workers who feel the obligations of Chapter 7 are not being met may lodge a complaint with government. Government representatives received and assessed numerous inquiries and complaints in 1998-99. Many were resolved through informal consultation among the affected parties and none proceeded to the formal dispute resolution procedure laid out in the Agreement on Internal Trade.

Community Information

The more you know about the community and region where you want to work, the better the chances are that you will find work. Information related to work at the local level is called "community labour market information." This includes local economic activity, potential employers, growing and declining sectors, and local services and programs.

sarily employed in the service sector. Cooks also find employment in logging camps and sales representatives work for manufacturing firms. But usually, workers in service occupations (cooks) work in a service industry (tourism).

Many occupations are becoming less distinct. To be successful, workers will need to be able to acquire a variety of skill sets that they can apply to a variety of industries. And the skill sets they acquire could cross a variety of occupational areas. For example, a computer programmer may also need to know sales and marketing, plus accounting and finance in order to work in a small high technology firm.

Workers can transfer their skills from one industry to another. Workers in declining sectors can research the labour market to identify growing sectors in which to work. For example, an accountant in the resources sector (declining) would likely find more future opportunities in the tourism sector (growing).

What is most important is knowing your skill sets and how you can apply them in the world of work. Nuala Beck, author *of Excelerate: Growing in the New Economy*, says that it doesn't matter what subject a person studies (or what skills he or she has), ". . . as long as you apply what you've learned in an industry that has a real future in the New Economy." Of course, there is still work to be had in "sunset" or declining sectors, but workers in these sectors need to keep track of trends to be prepared to find new opportunities in other areas if necessary.

Research Topics:

- What are the "sunrise" (growing) industries in the B.C. economy? What are the "sunset" (declining) industries? What is causing the growth/decline?
- How are globalization and technology affecting the industry(s) you are interested in?
- What effect will demographic changes have on the industry?
- What is the history of the industry?
- What is the size of the industry? What is its projected growth?
- Who are the key people/leaders in the industry?
- Who are the major employers?
- What occupations/roles are in demand in the sector?
- Who are the customers/clients the sector serves?
- What involvement does government have in the sector?
- What skills, education and training are expected of workers in the sector?

What's Labour Mobility?

"Labour mobility" refers to the freedom of workers to practise their occupation wherever opportunities exist. Every year, hundreds of thousands of people across Canada relocate to a different province or territory and look for work. Thousands more seek employment outside their home province without relocating. These people—particularly those who work in regulated occupations—sometime face delays, extra costs or other difficulties in having their qualifications recognized when they move across provincial or territorial boundaries. This has the effect of preventing or restricting their labour mobility and their ability to work.

The Agreement on Internal Trade (AIT), which came into effect in 1995, makes it easier for people, goods and services to move across Canada. Chapter 7 of the AIT—the Labour Mobility Chapter—says that any worker qualified for an occupation in one province or territory must be granted access to employment opportunities in that occupation in any other province or territory. This is particularly significant to the 20 percent of Canadians who work in regulated professions (like medicine or engineering) or trades (such as machinists and industrial mechanics (millwrights). Additional information on labour mobility in Canada can be accessed on the Internet at: *http://www.hrdc-drhc.gc.ca/stratpol/lmp/mobility/mobility.shtml*

As well, an Internet web site has been developed to provide licensing requirements of regulatory bodies in all provinces and territories and other employment and relocation information. Workers can access this information on the Internet at *http://www.workdestinations.org*

Workers who feel the obligations of Chapter 7 are not being met may lodge a complaint with government. Government representatives received and assessed numerous inquiries and complaints in 1998-99. Many were resolved through informal consultation among the affected parties and none proceeded to the formal dispute resolution procedure laid out in the Agreement on Internal Trade.

Community Information

The more you know about the community and region where you want to work, the better the chances are that you will find work. Information related to work at the local level is called "community labour market information." This includes local economic activity, potential employers, growing and declining sectors, and local services and programs.

Research Topics:

- What are the major sectors doing business in your community? Are they growing or declining?
- Who are the potential employers and what sector are they in?
- What skills, education and training do employers in your community expect?
- What are the seasonal employment trends in the community?
- What are the demographic (population) trends?
- What are the opportunities for self-employment?
- What education and training opportunities are there available for you in the community?

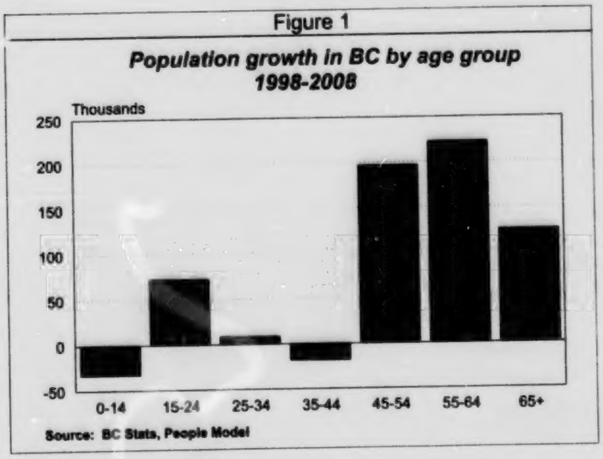
LMI in Action

Here are some examples of current labour market information; they show you how LMI statistics relate to the world of work and how you can interpret them as a career planner.

Demographics: We're getting older

Facts: B.C.'s population grew by almost 30 percent in the last ten years, more than twice as fast as the population for all of Canada. In the next ten years B.C.'s population is expected to expand by 16 percent, again at twice the pace expected for Canada overall. Immigrants from other countries and new arrivals from other parts of Canada will be the key sources of population growth. B.C.'s population is also growing older on average, with considerable growth expected in the number of persons aged 45 and older (see Figure 1). In 1996, half the population was under age 35, and half was over. By the year 2026, only 37 percent of B.C.'s population will be under age 35.

Figure 1



Population growth in BC by age group 1998-2008

Source: BC Stats, People Model

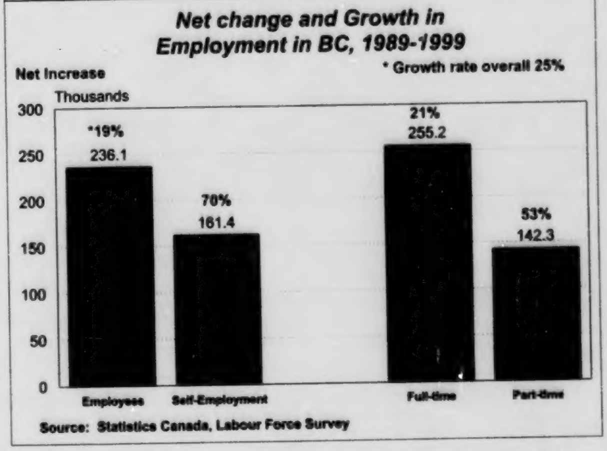
What this means: A growing population contributes to economic growth and additional employment. An aging population creates demand for specialized consumer goods and services. For example, aging Baby Boomers demand more services in health care, travel and recreation, and arts and culture. In addition, with the aging of the large group of Baby Boomers, there will be more retirements than ever before. This will create more job opportunities for younger people and more recent entrants to the labour market, especially those with the education and training required for professional and skilled trades occupations.

Self-Employment:

> *"If you want to know who you will be working for in the future, look in the mirror."*
>
> *- Ros Kunin, The Laurier Institute*

Facts: During the 1990s, self-employment grew at three times the pace of paid employment, and accounted for 40 percent of the overall increase in employment. Growth in part-time work expanded at twice the pace of full-time work, though 80 percent of all workers remain full-time. During 1999, full-time and paid employment saw a resurgence in growth, but self-employment and part-time continued to expand as well. Those with higher skills and education and training open up additional options of working for themselves in addition to working for others.

Figure 2



Net change and Growth in Employment in BC, 1989-1999

Source: Statistics Canada, Labour Force Survey

What this means: Growth in part-time, short-term and self-employment reflects the dynamic and fast changing world of work. At some point in your career, you may wish to become self-employed. Self-employment means you need to develop the entrepreneurial and self-management skills to help you take advantage of the work opportunities that come your way.

High Opportunity Occupations:

Welcome to the service sector!

Facts: The large table on page 16 shows the occupational areas which are predicted to offer favourable opportunities. Study this table carefully as it offers key information about both occupational and industry/sector trends in the B.C. economy.

High Opportunity Occupations In B.C., 2000-2010

The following occupational groupings, while not exactly a "top ten" list, highlight a number of the high-opportunity areas for British Columbians over the next ten years. This list provides an illustrative set of diverse occupations for consideration by career practitioners, young persons and career explorers - to stimulate further exploration and research. These occupational groupings were chosen on the basis of general labour market demand and supply considerations, using both qualitative and quantitative data, and additional information on occupational labour markets.

For the complete article and methodology, please see: *Overview of Some High Opportunity Occupations in B.C.*, at *http://www.aett.gov.bc.ca/branches/ea/reports/swfresearch.pdf*

Occupation	Comments
0621, 0631, 0632 … Managers in Accommodation, Food and Retail Trade	Growth in the related retail, accommodation and food services industries, as well as worker turnover, is contributing to ongoing need for experienced workers in these occupational groups. As well, these management positions are often open to younger workers with somewhat less experience than is required in other industries.
213, 214 … Professional Engineers	Recent graduates in most professional engineering fields are continuing to experience low unemployment and above average earnings when they enter the labour market. The outlook for electrical and electronic engineers as well as mechanical and computer engineers working with digital hardware and computer systems continues to be excellent. Slower growth is projected for civil and chemical engineers, with retirements and worker turnover contributing the most new employment openings.
2162, 2163 … Computer Systems Analysts and Programmers	The rapid and widespread introduction and application of information technology is driving continued strong demand for workers in these occupational groups. Workers with a broad computer education and industry recognized technical skills, continue to be in the highest demand. Communication and business skills also are a major asset. Technologist and technician occupations supporting these professional computer occupations are also in demand.
3152 … Registered Nurses	An aging population is increasing demand for health care services and contributing to employment growth. The need to replace retiring nurses is also generating additional employment. Specialty nurses, and registered nurses with several years experience in the main general practice streams, are most in demand. Current openings favour job seekers with experience, though new graduates are seeing very good entry opportunities as new nursing supply trails employment demand.
4152, 4212 … Social Workers, and Community and Social Service Workers	New government programs as well as an older work force in these occupations are contributing to considerable recent and expected new and replacement work opportunities. Social workers, particularly those with BSw degrees, are experiencing above average labour market conditions due to the emphasis on child protection and an increase in the numbers of workers needed - especially outside the larger metropolitan regions. More education and training, as well as strong people and communications skills and interests are essential in these occupations.
522 … Assisting Occupations in Graphic and Digital Arts, and Technical Occupations in Motion Pictures, Television and Theatre	Explosive growth in the electronic arts field continues to generate opportunities in assisting occupations combining design and computer skills - for example, computer games production, e-commerce applications, and website maintenance. In addition, continued growth in the motion picture sector, including video and television production, is creating the need for skilled technical workers from pre through post production. This is a very competitive field, and the dynamic nature of the sector includes non-standard hours of work and seasonality. These factors are balanced by above average earnings, and opportunities for advancement with experience.
5241, 5244 … Graphic Designers and Illustrating Artists, and Artisans and Craftpersons	The field of graphic design has undergone a radical transformation and expansion with the introduction of the computer to the design studio. Graphics designers and illustrating artists combining formal design education and strong computer and entrepreneurial skills are in greater demand, though this group, which also includes computer animation specialists, is working in a very competitive labour market. Excellent craft and artistic skills, along with good entrepreneurial skills are required in the dynamic but very competitive artisans and craftspersons occupational fields.
622, 641 … Technical Sales Specialists and Representatives, Wholesale	These are large occupational groups covering a range of sales specialties, including medical devices, computer and electronic hardware, health products, and particular transportation, scientific and manufacturing equipment and parts. Prior industry or product experience and knowledge are usually required, especially for technical sales specialists. Above average earnings, career progression opportunities and a high incidence of full-time, full-year work are available in these fields.
6241, 6242 … Chefs and Cooks	Above average growth in the hospitality and tourism industries continues to generate new jobs in these occupations. Attrition and turnover is also providing additional employment opportunities. Workers with trade certification or post-secondary training tend to see lower unemployment rates and the best advancement prospects.

What this means: The services sector dominates this list. Services vary from traditional (food and hospitality), to government (education and health), to business and the new scientific and technical services. Workers who can transfer their skills within the variety of businesses that exist within the services sector will find many opportunities.

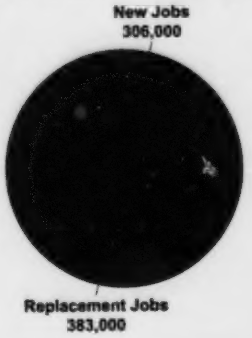
These high opportunity occupations also reflect the sectors that are projected to grow in the B.C. economy: tourism, science and technology, health care, arts and entertainment. You should always consider occupational information in relation to sector information. Also remember not to rely on occupational projections to make career decisions. Labour market projections aren't foolproof and should be viewed only as a guide.

Growth and Replacement Needs: More opportunities for younger workers

Facts: Of the total number of job openings projected to be available within the next 10 years, more will result from replacement needs than from economic growth. This high rate of replacement will be mostly the result of B.C.'s aging population retiring in the next ten years.

Figure 3

More employment openings will be to replace workers retiring...



Source: COPS 1999 BC Unique Scenario, 1998-2008

What this means: Younger people who have had trouble breaking into the labour market will have increased opportunities as more jobs become available as a result of retirement. For example, many teachers within the K-12 school system will retire in the next 10 years, offering opportunities to new graduates.

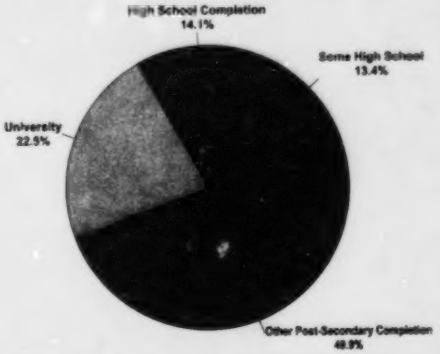
Educational Requirements for Jobs

Facts: Almost three quarters of job openings generated by economic growth and replacing retiring workers will require some form of education and training beyond high school (see Fig. 4). The unemployment rate for people who have not completed high school is twice as high as the rate for high school graduates and three times higher than for post-secondary graduates. In addition, earnings of workers are related to level of education. On average, earnings of post-secondary graduates are twice the level when compared to those with high school.

What this means: The knowledge economy puts a high premium on continuous learning. Most new jobs created in the next 10 years will require some form of post-secondary education or training. Broadening your skills and acquiring more education and training will help you succeed in the New Economy. It pays to stay in school, and workers need to keep on learning throughout their careers if they are to be successful.

Figure 4

Almost three quarters of job openings will require post-secondary education...



Source: COPS 1999 BC Unique Scenario, 1998-2008

Where to Find Labour Market Information Resources

You can use the categories above to gather, analyse and apply labour market information to your own career planning and work search. There are many sources of labour market information, and you should use as many of them as you can.

Use the Internet to find up-to-date and accessible information about the economy, occupations and sectors. You will find useful LMI Internet links at the end of this section. Also be sure to use B.C. WorkInfoNet as a one-start source of LMI. For other sources of LMI, go to section 2, *General Career Information Resources.*

The truth is that labour market information is really everywhere if you just look for it. It takes practice to become a labour market information expert to help you develop your career. The key is to keep your eyes and ears open and look for opportunities.

- Talk to employers in your community, business owners, friends and family about the labour market.
- Meet with staff in the training institutions you are interested in. Read college and university calendars.
- Talk to graduates of the education and training programs you are interested in.

Internet Resources for Understanding Labour Market Information

▼*General Economic and Labour Market Information*

Human Resources Development Canada:
http://www.bc.hrdc-drhc.gc.ca
HRDC's website for the B.C./Yukon region offers provincial and regional LMI. Click on "Research and Labour Market Information."

B.C. WorkInfoNet:
http://workinfonet.bc.ca
Your "one-start" shop for provincial career and labour market information.

A Guide to the B.C. Economy and Labour Market: http://workinfonet.bc.ca/lmisi/bc-econ/econdoc.html
Excellent introduction to economic concepts and language as well as B.C. industry/sector information. Start with "Introduction to the B.C. Economy."

Worklink:
http://www.worklink.com
Worklink provides resources and information to enhance employment for persons with disabilities and employers.

BCStats:
http://www.bcstats.gov.bc.ca
Statistics Canada:
http://www.statscan.ca
These are two excellent sources of statistics and research, including labour market information.

Facilitator's Guide to the B.C. Economy and Work Futures:
http://workinfonet.bc.ca/lmisi/facguide/index.htm
This online resource helps career practitioners use these resources with clients.

Making Career Sense of Labour Market Information:
http://www.est.gov.bc.ca/randa/lmi/making/mcstoc.htm
Introduces labour market concepts, trends and issues. It also provides practical examples of researching labour market information and using it in the career development process.

Daily Prospects in Canada's Labour Market: http://prospects.skillnet.ca
Daily information about occupations, industries and labour market trends across Canada.

▼*Education & Training LMI*

Guide to British Columbia's Public Post-Secondary Institutions:
http://www.aett.gov.bc.ca/postsecguide
Provides a global view of the types of programs offered at B.C. institutions and the kind of credentials that can be obtained. Brief descriptions of each institution are included.

Opening Doors:
http://www.openingdoorsbc.com
A powerful education planning resource that contains comprehensive information on about 1,380 undergraduate programs at B.C.'s 28 public post-secondary institutions.

Post-Secondary Application Service of B.C.: http://www.pas.bc.ca
PASBC is the province's online post-secondary application for admission system. Nineteen of B.C.'s universities, university colleges, colleges, and institutions are now accepting applications through the Internet.

Industry Training and Apprenticeship Commission:
http://www.itac.gov.bc.ca
Produced by the provincial government, this site provides information about the apprenticeship and trade certification system in B.C.

Government Financial Assistance:
http://www.pas.bc.ca/about_pse/financial.htm
This page offers links to information about the B.C. Student Assistance and the Canada Student Loan programs. Other resources are also included.

Financial Aid - Scholarships, Bursaries and Loans: http://www.bced.gov.bc.ca/careers/planning/educate/finance.htm
Offers information and tips about applying for financial assistance, budgeting, and finding information. Links to other useful resources are included.

- Read local and national newspapers and business publications. Information about company start-ups or closures and government employment initiatives gives you valuable information about what is happening in your community and where the work opportunities are.
- Keep up-to-date with the training and skills requirements in your occupational area. Improve your computer and technical skills. Keep on learning.

Start Your LMI Research

Use the research topics given above and start creating your own labour market information "profiles" or "fact sheets." You can prepare profiles on the "big picture" economic trends of globalization, technology and demographics. For more specific LMI that relates to your particular career goals, you can develop individual profiles for occupational, learning, sector and community labour market information.

> ***"We're in the Information Age. . .***
> ***If you're not adding to your store of knowledge***
> ***aggressively and continuously,***
> ***you're actually falling behind."***
>
> *- Janis Foord Kirk, SurvivAbility*

Internet Resources for Understanding Labour Market Information

CanLearn: http://canlearn.ca
Check out this Canadian resource for the information and interactive planning tools to explore learning opportunities, research occupations, develop learning strategies, and create the financial plans to achieve your goals.

▼*Industry/Sector LMI*

Human Resource Sector Councils: *http://www.councils.org*
Most of the 27 Sector Councils have websites that provide information about the sector such as professional development, career awareness, and online newsletters.

Industry Canada - Strategis: *http://strategis.ic.gc.ca*
This is the Federal Government's one-stop database for economic, trade, and government information.

Sector Studies: *http://www.hrdc-drhc.gc.ca/hrdc/hrib/hrp-prh/ssd-des/sector_e.html*
Sector Studies produced by the Sector Councils examine how changes in technology and the business environment affect the sectors' labour force including future employment. You can also find information about the following emerging sectors on this site: Aerospace, Biotechnology (agriculture, forestry, fishing, pharmaceuticals), Environment, Multimedia.

Sector Information in B.C.: *http://surfingforwork.ca*
This module from BCWIN's Surfing for Work tutorial offers an introduction to sectors in B.C. with links to specific sector resources related to career planning.

▼*Community LMI*

HRDC B.C. Community Profiles: *http://www.bc.hrdc-drhc.gc.ca/lmi/community/profiles.html*
Information about demographics, current job market, education, facilities and services for many communities in B.C.

Human Resources Development Canada: *http://www.bc.hrdc-drhc.gc.ca*
HRDC's website for the B.C./Yukon region, which provides links for online LMI provided by the Human Resource Centre for your community.

Community Skills Centre Consortium: *http://www.skills.bc.ca*
B.C. has a network of a number of Community Skills Centres throughout the province that provide training services to their local communities.

B.C. WorkInfoNet Community Information Database: *http://workinfonet.bc.ca/community.htm*
Working with the Community Skills Centres of British Columbia, BCWIN researches regional and local labour market and career-related information.

Guide to Using LMI: *http://www.skills.bc.ca/guide.html*
Check out this comprehensive online guide to help people use provincial LMI productively.

Work Destinations: A Guide to Relocation and Work in Canada: *http://www.workdestinations.org*
This site is designed for Canadians who want to practice their trade or profession in other provinces and territories.

What's Key in Labour Market Information in B.C.: *http://workinfonet.bc.ca/LMISI/WhatsKey*
This online "brochure" lists many of the LMI resources mentioned here, including information about how to order those that are available in other formats (e.g. print, CD-ROM, etc.).

▼*Occupational LMI*

See section 1, the How-to-Use Guide for links to occupational labour market information.

Choosing a Career: Step 3 - Making Decisions and Managing Your Career

How to Make a Decision

After learning about yourself and researching the labour market, you should be in a position to make a decision about your career path. This is the hardest step of career planning because there are so many options, and there is no one perfect career choice for anyone.

Apply a decision-making model: Using a decision-making model will help you through the process of deciding on a career path. Here's a practical model that is adapted from the *Guide to the Life/Work Portfolio* from the National Occupational Information Coordinating Committee, the U.S. government's national career and labour market information service (*http://www.noicc.gov*).

The decision you make after completing the process may result in any of the following directions:

- going back to school
- finding or changing employment
- volunteering in order to develop skills
- becoming an apprentice
- moving to where there are more work opportunities
- creating your own work (i.e. self-employment, contracting)
- retiring

Internet Resources for Understanding Labour Market Information

▼ *General Economic and Labour Market Information*

Human Resources Development Canada:
http://www.bc.hrdc-drhc.gc.ca
HRDC's website for the B.C./Yukon region offers provincial and regional LMI. Click on "Research and Labour Market Information."

B.C. WorkInfoNet:
http://workinfonet.bc.ca
Your "one-start" shop for provincial career and labour market information.

A Guide to the B.C. Economy and Labour Market: *http://workinfonet.bc.ca/lmisi/bc-econ/econdoc.html*
Excellent introduction to economic concepts and language as well as B.C. industry/sector information. Start with "Introduction to the B.C. Economy."

Worklink:
http://www.worklink.com
Worklink provides resources and information to enhance employment for persons with disabilities and employers.

BCStats:
http://www.bcstats.gov.bc.ca
Statistics Canada:
http://www.statscan.ca
These are two excellent sources of statistics and research, including labour market information.

Facilitator's Guide to the B.C. Economy and Work Futures:
http://workinfonet.bc.ca/lmisi/facguide/index.htm
This online resource helps career practitioners use these resources with clients.

Making Career Sense of Labour Market Information:
http://www.est.gov.bc.ca/randa/lmi/making/mcstoc.htm
Introduces labour market concepts, trends and issues. It also provides practical examples of researching labour market information and using it in the career development process.

Daily Prospects in Canada's Labour Market: *http://prospects.skillnet.ca*
Daily information about occupations, industries and labour market trends across Canada.

▼ *Education & Training LMI*

Guide to British Columbia's Public Post-Secondary Institutions:
http://www.aett.gov.bc.ca/postsecguide
Provides a global view of the types of programs offered at B.C. institutions and the kind of credentials that can be obtained. Brief descriptions of each institution are included.

Opening Doors:
http://www.openingdoorsbc.com
A powerful education planning resource that contains comprehensive information on about 1,380 undergraduate programs at B.C.'s 28 public post-secondary institutions.

Post-Secondary Application Service of B.C.: *http://www.pas.bc.ca*
PASBC is the province's online post-secondary application for admission system. Nineteen of B.C.'s universities, university colleges, colleges, and institutions are now accepting applications through the Internet.

Industry Training and Apprenticeship Commission:
http://www.itac.gov.bc.ca
Produced by the provincial government, this site provides information about the apprenticeship and trade certification system in B.C.

Government Financial Assistance:
http://www.pas.bc.ca/about_pse/financial.htm
This page offers links to information about the B.C. Student Assistance and the Canada Student Loan programs. Other resources are also included.

Financial Aid - Scholarships, Bursaries and Loans: *http://www.bced.gov.bc.ca/careers/planning/educate/finance.htm*
Offers information and tips about applying for financial assistance, budgeting, and finding information. Links to other useful resources are included.

- Read local and national newspapers and business publications. Information about company start-ups or closures and government employment initiatives gives you valuable information about what is happening in your community and where the work opportunities are.
- Keep up-to-date with the training and skills requirements in your occupational area. Improve your computer and technical skills. Keep on learning.

Start Your LMI Research

Use the research topics given above and start creating your own labour market information "profiles" or "fact sheets." You can prepare profiles on the "big picture" economic trends of globalization, technology and demographics. For more specific LMI that relates to your particular career goals, you can develop individual profiles for occupational, learning, sector and community labour market information.

> ***"We're in the Information Age. . .***
> ***If you're not adding to your store of knowledge***
> ***aggressively and continuously,***
> ***you're actually falling behind."***
>
> *- Janis Foord Kirk, SurvivAbility*

Internet Resources for Understanding Labour Market Information

CanLearn: http://canlearn.ca
Check out this Canadian resource for the information and interactive planning tools to explore learning opportunities, research occupations, develop learning strategies, and create the financial plans to achieve your goals.

▼*Industry/Sector LMI*

Human Resource Sector Councils: *http://www.councils.org*
Most of the 27 Sector Councils have websites that provide information about the sector such as professional development, career awareness, and online newsletters.

Industry Canada - Strategis: *http://strategis.ic.gc.ca*
This is the Federal Government's one-stop database for economic, trade, and government information.

Sector Studies: *http://www.hrdc-drhc.gc.ca/hrdc/hrib/hrp-prh/ssd-des/sector_e.html*
Sector Studies produced by the Sector Councils examine how changes in technology and the business environment affect the sectors' labour force including future employment. You can also find information about the following emerging sectors on this site: Aerospace, Biotechnology (agriculture, forestry, fishing, pharmaceuticals), Environment, Multimedia.

Sector Information in B.C.: *http://surfingforwork.ca*
This module from BCWIN's Surfing for Work tutorial offers an introduction to sectors in B.C. with links to specific sector resources related to career planning.

▼*Community LMI*

HRDC B.C. Community Profiles: *http://www.bc.hrdc-drhc.gc.ca/lmi/community/profiles.html*
Information about demographics, current job market, education, facilities and services for many communities in B.C.

Human Resources Development Canada: *http://www.bc.hrdc-drhc.gc.ca*
HRDC's website for the B.C./Yukon region, which provides links for online LMI provided by the Human Resource Centre for your community.

Community Skills Centre Consortium: *http://www.skills.bc.ca*
B.C. has a network of a number of Community Skills Centres throughout the province that provide training services to their local communities.

B.C. WorkInfoNet Community Information Database: *http://workinfonet.bc.ca/community.htm*
Working with the Community Skills Centres of British Columbia, BCWIN researches regional and local labour market and career-related information.

Guide to Using LMI: *http://www.skills.bc.ca/guide.html*
Check out this comprehensive online guide to help people use provincial LMI productively.

Work Destinations: A Guide to Relocation and Work in Canada: *http://www.workdestinations.org*
This site is designed for Canadians who want to practice their trade or profession in other provinces and territories.

What's Key in Labour Market information in B.C.: *http://workinfonet.bc.ca/LMISI/WhatsKey*
This online "brochure" lists many of the LMI resources mentioned here, including information about how to order those that are available in other formats (e.g. print, CD-ROM, etc.).

▼*Occupational LMI*

See section 1, the How-to-Use Guide for links to occupational labour market information.

Choosing a Career: Step 3 - Making Decisions and Managing Your Career

How to Make a Decision

After learning about yourself and researching the labour market, you should be in a position to make a decision about your career path. This is the hardest step of career planning because there are so many options, and there is no one perfect career choice for anyone.

Apply a decision-making model: Using a decision-making model will help you through the process of deciding on a career path. Here's a practical model that is adapted from the *Guide to the Life/Work Portfolio* from the National Occupational Information Coordinating Committee, the U.S. government's national career and labour market information service (*http://www.noicc.gov*).

The decision you make after completing the process may result in any of the following directions:

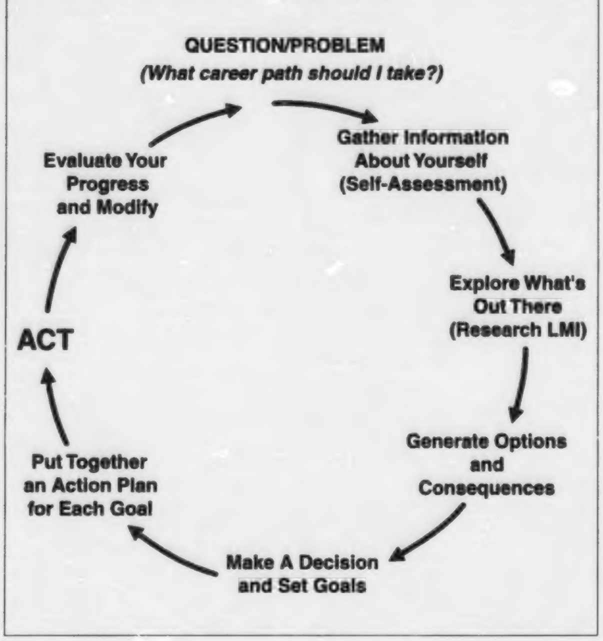
- going back to school
- finding or changing employment
- volunteering in order to develop skills
- becoming an apprentice
- moving to where there are more work opportunities
- creating your own work (i.e. self-employment, contracting)
- retiring

Develop an action plan: An action plan is an important part of the decision-making process. It is a series of steps that you take which will result in achieving a desired goal. You should write out your action plan which includes the steps you need to take to reach your goal. Be sure to attach a timeline to each of the steps.

Translating a decision into specific goals usually requires careful thinking. When your goals are specific, you have a clear direction in which to move. For example, if your decision is to start your own business, one of your first goals might be: *To take a course in small-business management and complete it by next spring*. When you write out an action plan for each goal, it is best to break big steps into smaller ones because they are easier to achieve.

Every time you face a new career decision (and you will face several throughout your life), you can use this model to work through the process.

Figure 5


QUESTION/PROBLEM
(What career path should I take?)
Gather Information About Yourself (Self-Assessment)
Explore What's Out There (Research LMI)
Generate Options and Consequences
Make A Decision and Set Goals
Put Together an Action Plan for Each Goal
ACT
Evaluate Your Progress and Modify

Don't act for the sake of action: When individuals face the challenge of making a career decision, they often feel panicked and pressured into making a quick decision. Deciding on a career direction is an important life step, and sufficient time and energy should be devoted to the process.

In his excellent book *Transitions - Making Sense of Life's Changes*, William Bridges talks about the process of change. Moving from school to work or changing careers in mid-life is an important transition for everyone. Bridges advises that the transition process requires not only that we bring a chapter of our lives to conclusion, but also that we discover whatever we need to learn for the next step we are going to take. We need to stay in transition long enough to complete this important process, not to abort it through premature action.

Managing Your Career

> *"Security can no longer be defined by a single employer or, for that matter, by a single job or occupation. Instead, we have little choice but to re-examine the whole notion of personal security as an aspect of employment. Simply put, "employment" no longer necessarily implies "a job." In the volatile new workplace, your security depends on you"*
>
> *- Janice Foord Kirk, SurvivAbility*

Now that all work is becoming more "entrepreneurial," workers have to be prepared for a variety of work alternatives and market their skills more creatively. Because of this fundamental change in the labour market, the notion of career self-management is emerging. Career self-management is a means not only of surviving in the New Economy, but also of thriving and making the best of its new opportunities. Learning how to make effective decisions throughout your life/work is one important aspect of career self-management.

Become a Self-Managed Worker

Essentially, career self-management is all about taking responsibility for your own career development. It means:

- not relying on any business, organization, government or union to look after your interests
- making a commitment to continuous learning so you will keep developing new skills
- being able to market yourself effectively to potential employers and clients
- taking responsibility for your personal financial security and work-related benefits
- learning to be adaptable and flexible in an era of rapid change
- taking risks, being creative, innovative, and courageous in the face of uncertainty
- thinking of yourself as self-employed, as "your own boss," even when you are working for someone else. William Bridges calls this approach "You and Co." You are the CEO (Chief Executive Officer) of your own career. You are in charge all the time, every day, in every situation.

Develop a Career Portfolio

> *"Crafting a portfolio showcasing your accomplishments will increase your power to communicate your worth to employers, customers, or clients."*
>
> *- Martin Kimeldorf*

The professional career portfolio is an exciting new tool that smart New Economy workers should have in their career management tool kit. Simply stated, a career portfolio is a place to assemble records and products of learning and work to help you gain new work opportunities, whether it's a new job, a promotion, or new business or customers.

The American portfolio guru, Martin Kimeldorf, defines a career portfolio in his comprehensive book *Portfolio Power - The New Way to Showcase All Your Job Skills and Experience.* The first syllable of the word *portfolio* comes from a Latin root *port*, meaning to move. The second syllable, *folio*, means papers or artifacts. So a *portfolio* is a portable collection of papers and/or artifacts (work samples).

Almost all career portfolios contain letters of reference, résumés, lists of accomplishments, and samples of work and learning. As portfolios become more important as job search tools, they can also include much more: artifacts that present one's communication skills (e.g. memos, reports, conference evaluations), people skills (e.g. agendas from committees, customer ratings, summary of training workshops), and technical skills (e.g. samples from manuals, job evaluations, photos of finished products, lists of services delivered). You can include anything in your portfolio that you want to "showcase" to a prospective employer, educational institution, or supervisor.

A career portfolio offers a **process for career development**: self-reflection, confirmation of skills, ongoing evaluation of career goals. Building a portfolio is an opportunity for you to identify your skills and examine your strengths and weaknesses. It increases your confidence about what you actually know and what you can do.

Career portfolios and skills: A well-designed career portfolio offers **concrete proof** of your abilities and demonstrates your skills, showing prospective employers or clients examples of your accomplishments. In the next chapter, you will learn more about employability skills and how to identify, develop and talk about them. Use this knowledge to help you build a skills portfolio that will help you stand out from the crowd.

Consider developing a career portfolio as one of the goals in your career action plan. At the end of this chapter, you will find Internet resources for more information. For more online resources, use the Internet to search on the phrase "career portfolio." Also check out your library and career information centres in your community for books on career portfolio development.

Build a Supportive Network

> *"People do business with people they know and trust or with people known and trusted by people they know and trust."*
> *- Walter Donald, Executive Network*

Networking is one of the most important career management skills you can have. Effective networking is not about using people or taking advantage of them. Rather it is about **building relationships** with people you know both on a personal level (such as family and friends) and a professional level (such as co-workers, other students in your program, or members of associations you belong to).

As we move into the new century, having a supportive and extensive network of contacts is essential if you are to find and keep work. Because the labour market is becoming so fragmented, a personal network of contacts that can support your career development is more important than it ever was before.

You can use networking to:

- learn about occupations and sectors
- find a job/work before or after graduation
- meet people who currently work in your career field
- create new business opportunities if you are self-employed
- get information about target industries or companies, actual job openings or employment trends
- develop rapport with prospective employers
- obtain additional names to enlarge your network
- establish new and beneficial connections that can help you in both your professional and personal life

Develop long-term relationships. Networking is all about getting to know people in the context of a long-term professional relationship and building trust within that relationship. As your networking relationships build, they become a source of valuable information and support which will help you in your career development.

Networking contacts can help you locate job opportunities in both the visible and hidden job markets. It is estimated that 65-90 percent of jobs are found through networking. As well, if you choose to be self-employed, much of your business will come from referrals and contacts made through your network.

Create your own Advisory Board: The *Radical Change in the World of Work* from the Alberta government (Advanced Education and Career Development) suggests creating an "advisory board" of people to help you with your career development. It advises that you identify key individuals you know who are aware of your goals and have an understanding of the changes you are making in your work life. For every issue (e.g., marketing your services, finding a job, addressing cash flow problems, fulfilling a contract), you identify people you know who can

help you. These people become your Advisory Board to help you resolve problems.

You can form an appropriate Board for each issue you must address. Your Board can provide you with information, give you advice and moral support, offer instruction, pass on job leads, and supply references. Keep in touch with your board members and nurture the relationships.

Improve your networking skills: Learning to network effectively takes time and practice, but you can learn how to become a super networker. Most libraries and career centres also have books on developing networking skills.

> *"Real networking is carefully tended give-and-take. It's the favour bank into which you make regular deposits as well as take out withdrawals."*
>
> *- Joyce Lain Kennedy*

Internet Resources for Decision-Making and Career Management

Career Paths: http://careerpathsonline.com
See "The 10-Step Career Planning Guide" for help with decision-making.

Canada Prospects: http://www.careerccc.org/english/showcase/index_e.htm
This annual publication is loaded with excellent information about career self-management. For career portfolio information, go to Section 2 of the 1999-2000 edition.

Staying Marketable: http://worksearch.gc.ca
Go to "Staying Marketable" for tips on how to manage your career.

A Summary of Career Portfolio Applications: http://www.lifework.ca/pr_blueprint.htm
See the latest edition of the *Blueprint For Life/Work Designs*. "Appendix E: Career Portfolios - Telling Your Life/Work Story" offers a summary of portfolio applications. A summary of career portfolio applications.

Portfolio Library: http://www.amby.com/kimeldorf/p_mk-toc.html
Offers a variety of articles by Martin Kimeldorf, a US career portfolio expert. Also provides an online example of a portfolio; see "Kimeldorf's Career Portfolio Sampler."

Motiv8: http://motiv8.com
A B.C. resource for young people making educational and work transitions.

Surfing for Work in British Columbia: http://worksearch.bc.ca/bcworksearch.htm
This online tutorial helps people develop skills to use the Internet to find work in British Columbia.

SkillNet: http://www.skillnet.ca
A one-stop shopping site for job postings and career-related information in Canada.

> ***"The best way to predict the future is to create it."***
>
> *- Stephen Covey*

help you. These people become your Advisory Board to help you resolve problems.

You can form an appropriate Board for each issue you must address. Your Board can provide you with information, give you advice and moral support, offer instruction, pass on job leads, and supply references. Keep in touch with your board members and nurture the relationships.

Improve your networking skills: Learning to network effectively takes time and practice, but you can learn how *to become a super networker.* Most libraries and career centres also have books on developing networking skills.

> *"Real networking is carefully tended give-and-take. It's the favour bank into which you make regular deposits as well as take out withdrawals."*
>
> *- Joyce Lain Kennedy*

Internet Resources for Decision-Making and Career Management

Career Paths: http://careerpathsonline.com
See "The 10-Step Career Planning Guide" for help with decision-making.

Canada Prospects: http://www.careerccc.org/english/showcase/index_e.htm
This annual publication is loaded with excellent information about career self-management. For career portfolio information, go to Section 2 of the 1999-2000 edition.

Staying Marketable: http://worksearch.gc.ca
Go to "Staying Marketable" for tips on how to manage your career.

A Summary of Career Portfolio Applications: http://www.lifework.ca/pr_blueprint.htm
See the latest edition of the *Blueprint For Life/Work Designs*. "Appendix E: Career Portfolios - Telling Your Life/Work Story" offers a summary of portfolio applications. A summary of career portfolio applications.

Portfolio Library: http://www.amby.com/kimeldorf/p_mk-toc.html
Offers a variety of articles by Martin Kimeldorf, a US career portfolio expert. Also provides an online example of a portfolio; see "Kimeldorf's Career Portfolio Sampler."

Motiv8: http://motiv8.com
A B.C. resource for young people making educational and work transitions.

Surfing for Work in British Columbia: http://worksearch.bc.ca/bcworksearch.htm
This online tutorial helps people develop skills to use the Internet to find work in British Columbia.

SkillNet: http://www.skillnet.ca
A one-stop shopping site for job postings and career-related information in Canada.

> ***"The best way to predict the future is to create it."***
>
> *- Stephen Covey*

+8

3. DEVELOPING SKILLS FOR TODAY'S WORKPLACE

Defining a Skill

The term "skill" is used to describe a person's ability to do something well. Therefore, if you are "skilled" in a certain area, you are expected to be able to perform that activity well or be competent in that area. Skills are also sometimes used to mean a certain level of education or training, the implication being that the more education a person has, the more skilled they are. You will see references to this particular use of the word "skill" on the NOC charts on pages 658 to 659 and in the "Index of Occupations by Skills Level" on pages 654 to 656.

It is generally agreed that working in the New Economy requires higher levels of education and training because more and different skills are required to do the work that the New Economy demands. Advances in technology and the constant change in working styles that those advances bring require workers to be skilled in entirely new ways.

The skills that are needed in the workplace today are:

- Career Development Skills or Competencies
- Occupation Specific Skills
- Employability Skills or generic transferable skills.

Career Development Skills

In earlier sections you were introduced to the ideas of Self-Assessment, Using Labour Market Information and Making Decisions. These ideas fit into the total picture of career development, but there are many more competencies which you should embrace in order for you to be able to plan for and respond to changes in the labour market.

You can expect to have as many as seven to nine jobs or career changes in your lifetime, and more of those opportunities will be found in self-employment, part time employment and a variety of other work styles. Possessing a set of career development skills will enable you to become more self-reliant and confident with your life/work future.

Your education and training plans should also flow out of the career development strategies you will be using to support your plan for your future life/work. Educational opportunities are costly and few people can afford to use post secondary education as a means of exploring career options. You will find your training more rewarding if you have made decisions based on a process which includes some life/work building competencies.

For your purposes as a career planner, you should be aware of the three sets of competencies and the kinds of skills that you can develop within each one. These competencies are a summary of information presented in the *Blueprint for Life/Work Designs* (see the text box for more information).

1. Personal Management Competencies
2. Learning and Work Exploration
3. Life/Work Building

Personal Management Competencies include:

- *Building a positive feeling about yourself*
  This competency includes knowing what your interests, strengths, personal qualities, skills, likes and dislikes, values, beliefs and attitudes are and how they contribute to the achievement of your goals and career decisions.

  You are able to adopt behaviours and attitudes which project a positive image of who you are. You should also be able to talk with some confidence about your skills, abilities, and interests and how they relate to your life/work decisions.
- *Interacting positively and effectively with others*
  Building positive relationships in your life includes showing an ability to resolve conflicts, be open to the diversity of cultures and lifestyles, be willing to help others, as well as working effectively with and for others. This competency also includes expressing ideas, feelings and reactions in an appropriate manner so that you will have positive relationships in your life and work.
- *Changing and growing throughout one's life*
  You will discover that change and growth affect your mental and physical health. You should be aware of how stress affects your ability to communicate and work effectively, and you can develop strategies that help you deal with the stresses in your life.

Learning and Work Exploration Competencies include:

- *Participating in lifelong learning that is supportive of your life/work goals.* Lifelong learning is a concept that you can embrace so that you will have a positive attitude to changes that come your way. You will need to explore the kinds of skills, knowledge and attitudes that are required in the various work sectors that interest you. You will need to know your own strengths and the areas where you need to improve so that you can focus your efforts on learning the appropriate things which will help you meet your goals. Competency in lifelong learning includes being able to investigate the various community resources and identify the appropriate educational opportunities for you as the need arises.

- *Locating and effectively using life/work information.* When you are skilled in this competency you will be able to research various work roles and industry sectors and discover how your particular interests, skills and knowledge relate to these work alternatives. You will be able to explore a variety of sources of work-related information such as the Internet, television, newspapers and networks of people. You will be able to use labour market information in the ways outlined in the earlier part of the *Work Futures* Introduction to assist you in your life/work decisions.
- *Understanding the relationship between work and society or the economy.* It is important to understand how work contributes to people's lifestyles and to the economy. Knowledge about the kind of contributions workers make to their communities as well as the concept of the "global economy" and current trends is helpful in understanding where your life/work decisions fit into society as a whole. When you are aware of these concepts you will be able to more clearly understand why certain work and learning opportunities are currently available.

Life/Work Building Competencies include:

- *Securing/creating and maintaining work.* Having the personal qualities which employers are looking for will help you be successful in obtaining work or creating your own work opportunities. There is a set of transferable employability skills, attitudes and behaviours which is outlined in the next section which you should be able to demonstrate. In addition, you should be able to use the strategies of planning, networking, and researching to help you find satisfying and meaningful work.
- *Making decisions which enhance your life/work.* When you are aware of the processes of decision-making and problem solving and how you can apply these strategies to your life/work plans, you will be able to see how your decisions affect yourself and others. You will see how your personal beliefs and interests contribute to the decisions you make for your life/work and be able to evaluate how well those decisions support your life/work goals. The decision-making process described in the previous section of this introduction is an example of this competency.
- *Maintaining Balanced Life and Work Roles.* You have a variety of roles in your life which are intertwined with your family, work and leisure activities. You will also go through several stages in your life. Knowing how these various roles and stages affect the attainment of your future goals and desired lifestyle is important. Being able to balance your work, family, and leisure activities requires strategies which can be learned and practised.
- *Understanding the changing nature of life/work roles.* Roles for men and women are changing in both life and work settings. When you investigate the non-traditional life/work scenarios, look at gender bias and stereotyping, and become clear on the kinds of roles you want to play in your life/work, you will be likely to engage in fulfilling life and work experiences.
- *Understanding, engaging in and managing one's own life/work building process.* You will be on your way to using this process when you understand and practice the concepts of: *change is constant, learning is an ongoing process, following your heart, goal setting,* and *creating strong relationships.* In addition, you should begin to consider the idea that every decision you make is a life/work decision, and you can make short term plans which will move you towards your preferred future.

The Blueprint for Life/Work Designs

http://lifework.ca/pr_blueprint.htm

The *Blueprint for Life/Work Designs* is the product of a national partnership which includes the Canadian government (HRDC) and the provincial and territorial governments. Career specialists from across Canada have been instrumental in its development and writing.

The *Blueprint for Life/Work Designs* is published by the National Life/Work Centre, Memramcook Institute, New Brunswick. It has been designed for career practitioners to offer:

- **A national framework for career development competencies**
- **A four-level developmental process with indicators at each level**
- **A foundation on which career practitioners can build programs**
- **A set of guidelines for the establishment and evaluation of career programs**
- **A collection of Appendices which include Sample Forms, Links to other Skills Frameworks, Portfolio Uses and Resources, and Career Resources, among others**

Note that the entire document is available from the website above or it can be ordered by calling toll-free at 1-888-533-5683. Free copies are available for a limited time.

Occupation-Specific Skills

Occupation-specific skills are those skills needed to work in a particular occupation. A worker's occupation-specific skills can range from beginner or entry level to expert levels. You will find references to specific skills that are required in various occupations in the Occupational Profiles that follow in this publication. These skills are obtained through on-the-job training and experience as well as specialized education or training. You will need to evaluate whether the occupation-specific skills being taught in educational and training programs match the demands of the labour market and your career goals.

You will become an informed consumer of educational services as you work on your career development skills. The need for skills upgrading or retraining will occur regularly for workers in the New Economy. Furthermore, in today's complex and competitive world, a post-secondary diploma, certificate or degree is no longer a guarantee of employment.

Just because a course is offered by a university, college or private institution, doesn't mean there will be employment for all or most of the graduates. Unfortunately, some people have invested time and money in training and have had difficulty finding work. It is important for you, as a student or someone returning to part-time or full-time studies, to become informed consumers of educational services. It is important to research the field of study you are interested in to see if graduates from training programs are becoming employed.

Applied Programs and General Education Programs

There are two broad categories of post secondary programs taught at colleges and universities:

- Programs taught at colleges, institutes and universities which teach specific skills that can be directly applied to a particular occupation are referred to as applied programs and include commerce, engineering, applied science, health, and education programs.
- Programs that provide a broader base of knowledge which can generally be used in many occupations are referred to as general education programs and include sciences, liberal arts (humanities, social science, fine arts), as well as university transfer programs.

Choosing the Right Program

The relevance and quality of any prospective program should always be researched. Some suggested selection criteria from the Ministry of Advanced Education, Training and Technology are:

- **Is the training program recognized by employers? (Call some companies and ask if they hire graduates from the program under consideration.)**
- **Do the instructors have recent industry experience?**
- **Is the equipment up-to-date and compatible with that being used in business and/or industry?**
- **Is the institution willing and able to provide the names and addresses of persons who have attained employment after completion of the program?**
- **Does the cost and course content compare favourably with those of similar programs in other institutions?**
- **Does the institution make any effort to find employment for the graduates after graduation?**
- **Is the institution recognized and/or accredited by any industry or business association (e.g. Association of Canadian Career Colleges, Private Career Training Associations, National Accreditation Commission)?**

It Pays to Stay in School

All the research about labour market activity shows that people with higher education fare better. On average, workers with a university degree have higher incomes and lower unemployment than those with less education. In turn, workers with trades certificates and college diplomas fare better than those with high school or less.

Why does it pay to stay in school and get an education? New jobs require more occupation-specific skills and education is needed to get these skills. Also, more education is usually associated with higher literacy, numeracy, and analytical skills which employers expect in nearly all jobs today.

There are fewer and fewer unskilled jobs. Look again at Figure 4 in section 2, on page 17 to see that almost three-quarters (72%) of all job openings require more than high school completion.

Although staying in school and planning for post-secondary education for training is a strong feature of career development, you must not be complacent about having reached the end of your education. You must be prepared to continue to improve and update your occupation-specific skills because of the rapidly changing nature of work that no one can predict.

are required in the various work sectors that interest you. You will need to know your own strengths and the areas where you need to improve so that you can focus your efforts on learning the appropriate things which will help you meet your goals. Competency in lifelong learning includes being able to investigate the various community resources and identify the appropriate educational opportunities for you as the need arises.

- *Locating and effectively using life/work information.* When you are skilled in this competency you will be able to research various work roles and industry sectors and discover how your particular interests, skills and knowledge relate to these work alternatives. You will be able to explore a variety of sources of work-related information such as the Internet, television, newspapers and networks of people. You will be able to use labour market information in the ways outlined in the earlier part of the *Work Futures* Introduction to assist you in your life/work decisions.
- *Understanding the relationship between work and society or the economy.* It is important to understand how work contributes to people's lifestyles and to the economy. Knowledge about the kind of contributions workers make to their communities as well as the concept of the "global economy" and current trends is helpful in understanding where your life/work decisions fit into society as a whole. When you are aware of these concepts you will be able to more clearly understand why certain work and learning opportunities are currently available.

Life/Work Building Competencies include:

- *Securing creating and maintaining work.* Having the personal qualities which employers are looking for will help you be successful in obtaining work or creating your own work opportunities. There is a set of transferable employability skills, attitudes and behaviours which is outlined in the next section which you should be able to demonstrate. In addition, you should be able to use the strategies of planning, networking, and researching to help you find satisfying and meaningful work.
- *Making decisions which enhance your life/work.* When you are aware of the processes of decision-making and problem solving and how you can apply these strategies to your life/work plans, you will be able to see how your decisions affect yourself and others. You will see how your personal beliefs and interests contribute to the decisions you make for your life/work and be able to evaluate how well those decisions support your life/work goals. The decision-making process described in the previous section of this introduction is an example of this competency.
- *Maintaining Balanced Life and Work Roles.* You have a variety of roles in your life which are intertwined with your family, work and leisure activities. You will also go through several stages in your life. Knowing how these various roles and stages affect the attainment of your future goals and desired lifestyle is important. Being able to balance your work, family, and leisure activities requires strategies which can be learned and practised.
- *Understanding the changing nature of life/work roles.* Roles for men and women are changing in both life and work settings. When you investigate the non-traditional life/work scenarios, look at gender bias and stereotyping, and become clear on the kinds of roles you want to play in your life/work, you will be likely to engage in fulfilling life and work experiences.
- *Understanding, engaging in and managing one's own life/work building process.* You will be on your way to using this process when you understand and practice the concepts of: *change is constant, learning is an ongoing process, following your heart, goal setting*, and *creating strong relationships*. In addition, you should begin to consider the idea that every decision you make is a life/work decision, and you can make short term plans which will move you towards your preferred future.

The Blueprint for Life/Work Designs

http://lifework.ca/pr_blueprint.htm

The *Blueprint for Life/Work Designs* is the product of a national partnership which includes the Canadian government (HRDC) and the provincial and territorial governments. Career specialists from across Canada have been instrumental in its development and writing.

The *Blueprint for Life/Work Designs* is published by the National Life/Work Centre, Memramcook Institute, New Brunswick. It has been designed for career practitioners to offer:

- **A national framework for career development competencies**
- **A four-level developmental process with indicators at each level**
- **A foundation on which career practitioners can build programs**
- **A set of guidelines for the establishment and evaluation of career programs**
- **A collection of Appendices which include Sample Forms, Links to other Skills Frameworks, Portfolio Uses and Resources, and Career Resources, among others**

Note that the entire document is available from the website above or it can be ordered by calling toll-free at 1-888-533-5683. Free copies are available for a limited time.

Occupation-Specific Skills

Occupation-specific skills are those skills needed to work in a particular occupation. A worker's occupation-specific skills can range from beginner or entry level to expert levels. You will find references to specific skills that are required in various occupations in the Occupational Profiles that follow in this publication. These skills are obtained through on-the-job training and experience as well as specialized education or training. You will need to evaluate whether the occupation-specific skills being taught in educational and training programs match the demands of the labour market and your career goals.

You will become an informed consumer of educational services as you work on your career development skills. The need for skills upgrading or retraining will occur regularly for workers in the New Economy. Furthermore, in today's complex and competitive world, a post-secondary diploma, certificate or degree is no longer a guarantee of employment.

Just because a course is offered by a university, college or private institution, doesn't mean there will be employment for all or most of the graduates. Unfortunately, some people have invested time and money in training and have had difficulty finding work. It is important for you, as a student or someone returning to part-time or full-time studies, to become informed consumers of educational services. It is important to research the field of study you are interested in to see if graduates from training programs are becoming employed.

Applied Programs and General Education Programs

There are two broad categories of post secondary programs taught at colleges and universities:

- Programs taught at colleges, institutes and universities which teach specific skills that can be directly applied to a particular occupation are referred to as applied programs and include commerce, engineering, applied science, health, and education programs.
- Programs that provide a broader base of knowledge which can generally be used in many occupations are referred to as general education programs and include sciences, liberal arts (humanities, social science, fine arts), as well as university transfer programs.

Choosing the Right Program

The relevance and quality of any prospective program should always be researched. Some suggested selection criteria from the Ministry of Advanced Education, Training and Technology are:

- **Is the training program recognized by employers? (Call some companies and ask if they hire graduates from the program under consideration.)**
- **Do the instructors have recent industry experience?**
- **Is the equipment up-to-date and compatible with that being used in business and/or industry?**
- **Is the institution willing and able to provide the names and addresses of persons who have attained employment after completion of the program?**
- **Does the cost and course content compare favourably with those of similar programs in other institutions?**
- **Does the institution make any effort to find employment for the graduates after graduation?**
- **Is the institution recognized and/or accredited by any industry or business association (e.g. Association of Canadian Career Colleges, Private Career Training Associations, National Accreditation Commission)?**

It Pays to Stay in School

All the research about labour market activity shows that people with higher education fare better. On average, workers with a university degree have higher incomes and lower unemployment than those with less education. In turn, workers with trades certificates and college diplomas fare better than those with high school or less.

Why does it pay to stay in school and get an education? New jobs require more occupation-specific skills and education is needed to get these skills. Also, more education is usually associated with higher literacy, numeracy, and analytical skills which employers expect in nearly all jobs today.

There are fewer and fewer unskilled jobs. Look again at Figure 4 in section 2, on page 17 to see that almost three-quarters (72%) of all job openings require more than high school completion.

Although staying in school and planning for post-secondary education for training is a strong feature of career development, you must not be complacent about having reached the end of your education. You must be prepared to continue to improve and update your occupation-specific skills because of the rapidly changing nature of work that no one can predict.

Some points to consider about applied versus general education programs are:

- Graduates from programs that do not have a direct link with a particular occupation, such as those offering college diplomas in liberal arts or academic university undergraduate degrees in the sciences, will likely have to seek employment in a range of occupations which may or may not be directly related to their field of study. When this is the case, graduates are often expected to be able to apply to their work their superior communication skills, teamwork skills, critical thinking skills and other transferable employability skills as discussed in the next chapter.
- Graduates from programs that do have a direct link with an occupation may also have to find employment in unrelated fields if the demand for workers in that occupation is low. They should also be prepared to show how their education and training has helped them develop the very important transferable employability skills.

Some Recent B.C. Student Outcomes Results

The most recent follow-up surveys of those who have completed post-secondary education in B.C. provide some insight into the differences in employment and other outcomes between those from occupational specific programs and general programs. They also highlight some differences in the main reasons why these graduates originally enrolled in their programs. It is useful for you to research what former graduates have said about the particular program you are looking at and see if this information might apply to you and your plans. These surveys and their websites are found in the box entitled, Student Outcomes and Graduate Follow-up Surveys.

There are Many Routes to Learning

In addition to institutes, colleges and universities that offer trade/vocational, career/technical, applied, and academic credit courses, there are:

- private training facilities,
- apprenticeship training (see Apprenticeship Appendix),
- distance education,
- workplace in-house training,
- adult education programs,
- correspondence programs, and
- independent study.

As already highlighted, whatever learning route you choose, you must research the relevance and quality of the program in relation to your life/work goals. When using student outcomes or graduate follow-up survey results, remember graduates' success in the labour market depends not only on the field and level of study, but on many other factors as well. Some of these factors are: the economic climate at the time of graduation, previous work experience, academic standing, personal and family responsibilities, work search skills, and your ability to apply transferable skills such as communication, critical thinking and teamwork skills.

It is also important to remember that everyone's learning needs and preferences are different. What works for another student may not work for you. Any combination of factors can influence how you get to your desired goal, including cost of the program, location of the post-secondary institution, your family situation, any language barriers you might have and your preferred learning styles. These factors should be assessed and taken into consideration as you custom-design your learning plans.

Student Outcomes and Graduate Follow-up Surveys

The relevance and quality of any prospective program should always be researched. You should talk to a program instructor to ask about the employment rates of the graduates and ask to see any follow-up surveys done by the institution itself.

The following online reports may also assist you. Print copies should also be available at counselling/advising centres and libraries.

- ***B.C. Student Outcomes: Survey Results by Program for Former College and Institute Students*** **prepared for the B.C. Ministry of Advanced Education, Training and Technology, and Human Resources Development Canada (HRDC) (*http://ceiss.org/edresearch/collegeoutcomes.asp*)**
- ***One Year Graduate Follow-up Survey of 1996 Baccalaureate Graduates from B.C.'s Public Universities*** **prepared for the University Presidents' Council (*www.tupc.bc.ca*)**

Other student outcome reports are available through the Centre for Education Information Standards and Services (CEISS). Check them out at this website: *http://www.ceiss.org/edresearch*.

Some points to consider about applied versus general education programs are:

- Graduates from programs that do not have a direct link with a particular occupation, such as those offering college diplomas in liberal arts or academic university undergraduate degrees in the sciences, will likely have to seek employment in a range of occupations which may or may not be directly related to their field of study. When this is the case, graduates are often expected to be able to apply to their work their superior communication skills, teamwork skills, critical thinking skills and other transferable employability skills as discussed in the next chapter.
- Graduates from programs that do have a direct link with an occupation may also have to find employment in unrelated fields if the demand for workers in that occupation is low. They should also be prepared to show how their education and training has helped them develop the very important transferable employability skills.

Some Recent B.C. Student Outcomes Results

The most recent follow-up surveys of those who have completed post-secondary education in B.C. provide some insight into the differences in employment and other outcomes between those from occupational specific programs and general programs. They also highlight some differences in the main reasons why these graduates originally enrolled in their programs. It is useful for you to research what former graduates have said about the particular program you are looking at and see if this information might apply to you and your plans. These surveys and their websites are found in the box entitled, Student Outcomes and Graduate Follow-up Surveys.

There are Many Routes to Learning

In addition to institutes, colleges and universities that offer trade/vocational, career/technical, applied, and academic credit courses, there are:

- private training facilities,
- apprenticeship training (see Apprenticeship Appendix),
- distance education,
- workplace in-house training,
- adult education programs,
- correspondence programs, and
- independent study.

As already highlighted, whatever learning route you choose, you must research the relevance and quality of the program in relation to your life/work goals. When using student outcomes or graduate follow-up survey results, remember graduates' success in the labour market depends not only on the field and level of study, but on many other factors as well. Some of these factors are: the economic climate at the time of graduation, previous work experience, academic standing, personal and family responsibilities, work search skills, and your ability to apply transferable skills such as communication, critical thinking and teamwork skills.

It is also important to remember that everyone's learning needs and preferences are different. What works for another student may not work for you. Any combination of factors can influence how you get to your desired goal, including cost of the program, location of the post-secondary institution, your family situation, any language barriers you might have and your preferred learning styles. These factors should be assessed and taken into consideration as you custom-design your learning plans.

Student Outcomes and Graduate Follow-up Surveys

The relevance and quality of any prospective program should always be researched. You should talk to a program instructor to ask about the employment rates of the graduates and ask to see any follow-up surveys done by the institution itself.

The following online reports may also assist you. Print copies should also be available at counselling/advising centres and libraries.

- ***B.C. Student Outcomes: Survey Results by Program for Former College and Institute Students* prepared for the B.C. Ministry of Advanced Education, Training and Technology, and Human Resources Development Canada (HRDC) (http://ceiss.org/edresearch/collegeoutcomes.asp)**
- ***One Year Graduate Follow-up Survey of 1996 Baccalaureate Graduates from B.C.'s Public Universities* prepared for the University Presidents' Council (www.tupc.bc.ca)**

Other student outcome reports are available through the Centre for Education Information Standards and Services (CEISS). Check them out at this website: http://www.ceiss.org/edresearch.

47

Entrepreneurship and an Entrepreneurial Attitude

> *"I don't think anyone ever is born an entrepreneur. I became an entrepreneur and, if I could do it so can you . . . Entrepreneurs are people like you, who have learned to do what they do."*
>
> *- Jim Lang, Make Your Own Breaks*

While you are developing your career development competencies and refining the direction you wish your career to take, it is important to consider that there are many ways in which you can apply your occupation-specific skills. You may find many opportunities to use your training through self-employment. Self-employment is one of the fastest growing areas of employment in Canada today.

Furthermore, developing an entrepreneurial attitude is essential in today's job market, even if you wish to work with an established company. No matter how good your occupation-specific skills are, you will have to market yourself to show that your combination of skills and abilities are indeed those that are needed. There are also many companies which are looking to contract or sub-contract out some of their work. They may have fewer employees in a department but most of the work probably still needs to be done. Therefore they might be looking for someone with your occupation-specific skills along with an entrepreneurial attitude which would enable you to offer them some services.

So what does it mean to have entrepreneurial skills and an entrepreneurial attitude? Most of the employability skills described in the next section will also apply to you if you choose to work on your own, but in addition, you will also need some business management, marketing and networking skills.

Take a look at the following list of characteristics and skills that Jim Lang, a Canadian entrepreneur and author of *Make Your Own Breaks: Become an Entrepreneur and Create Your Own Future* says entrepreneurs bring to their ventures. It may surprise you that many of these characteristics already describe you.

Entrepreneurs tend to be:
- self confident
- self-starters who take the initiative
- optimistic and positive thinkers
- sensitive to opportunities
- creative thinkers and creative problem solvers
- good team builders and players
- motivated by the desire to accomplish things
- willing to take calculated risks
- community-minded
- involved in ventures centered on their interests and expertise.

If you would like to research more information on entrepreneurship, use your Internet search engine to take you to many websites which will provide you with information about small business startup and funding opportunities. Also check the Internet sites at the end of this section.

Employability Skills

> *"Skilled persons become capable of independence; they are able to apply their skills in appropriate ways to meet their own educational or workplace needs."*
>
> *- Understanding Employability Skills, The Conference Board of Canada.*

The third set of skills you need for the New Economy are employability skills. To avoid confusion, it is important to know that there are many labels for these particular skills. You may find all, some, or combinations of them referred to as, generic skills, transferable skills, basic skills, core skills, core competencies, critical workplace competencies, workability skills, non-technical skills, soft skills, and essential skills. It is important to understand that these are really mainly the same skills. Note that employability skills are different from work search skills such as resume writing, interview preparation and networking.

The term "employability skills" was coined by the Conference Board of Canada in 1992 when it described the set of skills that employers identified as those needed for a high-quality Canadian workforce. We have come to realize that these transferable, generic skills are the ones which are needed throughout all career and life development activities. They can be applied in all environments and may be transferred to new and constantly changing contexts. For this reason, the acquisition of employability skills must be part of the career development process so that you are able to actively use them and apply them to a variety of situations.

The Conference Board has recently updated its list of Employability Skills and combined it with the list of skills needed for Science Literacy for the World of Work. This list is called *Employability Skills 2000+* and is reproduced on page 28.

A key feature to possessing these skills is not only being aware of what they are, but also being able to use them and apply them to different situations. That means being

Employability Skills 2000+

The skills you need to enter, stay in, and progress in the world of work—whether you work on your own or as a part of a team.

These skills can also be applied and used beyond the workplace in a range of daily activities.

Fundamental Skills

The skills needed as a base for further development

You will be better prepared to progress in the world of work when you can:

Communicate

- read and understand information presented in a variety of forms (e.g., words, graphs, charts, diagrams)
- write and speak so others pay attention and understand
- listen and ask questions to understand and appreciate the points of view of others
- share information using a range of information and communications technologies (e.g., voice, e-mail, computers)
- use relevant scientific, technological and mathematical knowledge and skills to explain or clarify ideas

Manage Information

- locate, gather and organize information using appropriate technology and information systems
- access, analyze and apply knowledge and skills from various disciplines (e.g., the arts, languages, science, technology, mathematics, social sciences, and the humanities)

Use Numbers

- decide what needs to be measured or calculated
- observe and record data using appropriate methods, tools and technology
- make estimates and verify calculations

Think & Solve Problems

- assess situations and identify problems
- seek different points of view and evaluate them based on facts
- recognize the human, interpersonal, technical, scientific and mathematical dimensions of a problem
- identify the root cause of a problem
- be creative and innovative in exploring possible solutions
- readily use science, technology and mathematics as ways to think, gain and share knowledge, solve problems and make decisions
- evaluate solutions to make recommendations or decisions
- implement solutions
- check to see if a solution works, and act on opportunities for improvement

Personal Management Skills

The personal skills, attitudes and behaviours that drive one's potential for growth

You will be able to offer yourself greater possibilities for achievement when you can:

Demonstrate Positive Attitudes & Behaviours

- feel good about yourself and be confident
- deal with people, problems and situations with honesty, integrity and personal ethics
- recognize your own and other people's good efforts
- take care of your personal health
- show interest, initiative and effort

Be Responsible

- set goals and priorities balancing work and personal life
- plan and manage time, money and other resources to achieve goals
- assess, weigh and manage risk
- be accountable for your actions and the actions of your group
- be socially responsible and contribute to your community

Be Adaptable

- work independently or as a part of a team
- carry out multiple tasks or projects
- be innovative and resourceful: identify and suggest alternative ways to achieve goals and get the job done
- be open and respond constructively to change
- learn from your mistakes and accept feedback
- cope with uncertainty

Learn Continuously

- be willing to continuously learn and grow
- assess personal strengths and areas for development
- set your own learning goals
- identify and access learning sources and opportunities
- plan for and achieve your learning goals

Work Safely

- be aware of personal and group health and safety practices and procedures, and act in accordance with these

Teamwork Skills

The skills and attributes needed to contribute productively

You will be better prepared to add value to the outcomes of a task, project or team when you can:

Work with Others

- understand and work within the dynamics of a group
- ensure that a team's purpose and objectives are clear
- be flexible: respect, be open to and supportive of the thoughts, opinions and contributions of others in a group
- recognize and respect people's diversity, individual differences and perspectives
- accept and provide feedback in a constructive and considerate manner
- contribute to a team by sharing information and expertise
- lead or support when appropriate, motivating a group for high performance
- understand the role of conflict in a group to reach solutions
- manage and resolve conflict when appropriate

Participate in Projects & Tasks

- plan, design or carry out a project or task from start to finish with well-defined objectives and outcomes
- develop a plan, seek feedback, test, revise and implement
- work to agreed quality standards and specifications
- select and use appropriate tools and technology for a task or project
- adapt to changing requirements and information
- continuously monitor the success of a project or task and identify ways to improve

The Conference Board of Canada

255 Smyth Road, Ottawa
ON K1H 8M7 Canada
Tel. (613) 526-3280
Fax (613) 526-4857
Internet: www.conferenceboard.ca/nbec

able to perform them or demonstrate them in more than one way, depending on the circumstances.

How to Develop Employability Skills for Career Development

> *"Employability skills give people not only the means with which to make a living but also the wherewithal to live a meaningful life."*
> *- Understanding Employability Skills, The Conference Board of Canada*

Following is a strategy you could use which will help you to develop or improve your employability skills. Keep in mind that improving these skills also increases and supports your career development competencies.

Know what each skill is. The first step to learning is being aware of what it is you need to know. Study the wording on the Employability Skills 2000+ list and start to use the skills language. It is important to be able to describe these skills in the language employers recognize.

Look for places where each skill is being used. Begin by observing people using each skill in everyday activities and you will soon see how these skills are used all around you. You might talk about a particular skill with a colleague or a family member to see how often they use that skill, and the kind of situations they see themselves in when they have had to use or apply it. Remember that the key to possessing these skills is being able to demonstrate them. Begin by observing others using them in a variety of activities so that you become familiar with the actions people use.

You might interview other workers about their use of these skills so that you will gain a more in-depth knowledge of their application. You might develop some questions which will help you see how these skills are really used in action. Here is an example of how you could compose some questions.

Under the Personal Management Skills column of the Employability Skills 2000+ table on page 28, see ***Be Adaptable****, be able to work independently or as part of a team.* You could ask some of the following questions about this skill:

- Do you work alone? When do you have to work on your own? What kind of skills do you need to work alone?
- When do you work as part of a team? Is this the way you always work or does it change from time to time?
- What kind of projects or activities do you work on with others? Who does most of the work in the group?
- What kind of a role do you have when you work with others? Are you the leader or do you always do what others tell you to do? Do you get a chance to express your opinions? To contribute suggestions to the group?
- What other skills do you have to use at the same time? Communication Skills? Problem Solving Skills? Respect for individual differences?

The Employability Skills Tool Kit

http://www.conferenceboard.ca/nbec/toolkit.htm

The *Employability Skills Toolkit for the Self-Managing Learner* is a resource produced by the Conference Board of Canada based on the *Employability Skills 2000+* project. The Toolkit is designed for individuals to identify and improve their employability skills. It is a group of practical tools designed to help you:

- **Know yourself and get feedback**
- **Identify and reflect on your skills**
- **Plan skills development activities**
- **Implement your development plans and practice your skills**
- **Document and market your skills for best success**

For more information on the Toolkit, visit the Conference Board's website above.

Questions such as these will also help you with your career development competencies, and you will get to know whether or not you really want to work in a particular occupation, given the skills and abilities you have developed and enjoy using.

Decide how well you use these skills yourself. Think about times when you have really been able to excel at using each skill and times when you wish you had been a little better. Ask yourself if you think you have completely mastered this skill, have somewhat mastered it, or whether you need to improve it a great deal.

Find examples in your own life experiences where you have used each skill well. You can begin to use those examples as a foundation on which to build your repertoire of skills as well as your ability to talk about their use. Keep a record in some way such as a journal or notes for a portfolio so that you can draw upon your experiences and examples when you need them. Being able to talk about how you use these skills and feeling confident enough to give examples will be an advantage to you when preparing for an interview or creating a skills portfolio.

Today many employers want to know that their prospective employees have the ability to solve problems and think quickly on their feet and not reply with an "I don't know" attitude. If you have put together a few examples of when you have used your problem-solving abilities or showed how flexible you are, you will be able to give those examples when asked what you might do in a situa-

able to perform them or demonstrate them in more than one way, depending on the circumstances.

How to Develop Employability Skills for Career Development

> *"Employability skills give people not only the means with which to make a living but also the wherewithal to live a meaningful life."*
> - *Understanding Employability Skills, The Conference Board of Canada*

Following is a strategy you could use which will help you to develop or improve your employability skills. Keep in mind that improving these skills also increases and supports your career development competencies.

Know what each skill is. The first step to learning is being aware of what it is you need to know. Study the wording on the Employability Skills 2000+ list and start to use the skills language. It is important to be able to describe these skills in the language employers recognize.

Look for places where each skill is being used. Begin by observing people using each skill in everyday activities and you will soon see how these skills are used all around you. You might talk about a particular skill with a colleague or a family member to see how often they use that skill, and the kind of situations they see themselves in when they have had to use or apply it. Remember that the key to possessing these skills is being able to demonstrate them. Begin by observing others using them in a variety of activities so that you become familiar with the actions people use.

You might interview other workers about their use of these skills so that you will gain a more in-depth knowledge of their application. You might develop some questions which will help you see how these skills are really used in action. Here is an example of how you could compose some questions.

Under the Personal Management Skills column of the Employability Skills 2000+ table on page 28, see ***Be Adaptable****, be able to work independently or as part of a team.* You could ask some of the following questions about this skill:

- Do you work alone? When do you have to work on your own? What kind of skills do you need to work alone?
- When do you work as part of a team? Is this the way you always work or does it change from time to time?
- What kind of projects or activities do you work on with others? Who does most of the work in the group?
- What kind of a role do you have when you work with others? Are you the leader or do you always do what others tell you to do? Do you get a chance to express your opinions? To contribute suggestions to the group?
- What other skills do you have to use at the same time? Communication Skills? Problem Solving Skills? Respect for individual differences?

The Employability Skills Tool Kit

http://www.conferenceboard.ca/nbec/toolkit.htm

The *Employability Skills Toolkit for the Self-Managing Learner* is a resource produced by the Conference Board of Canada based on the *Employability Skills 2000+* project. The Toolkit is designed for individuals to identify and improve their employability skills. It is a group of practical tools designed to help you:

- **Know yourself and get feedback**
- **Identify and reflect on your skills**
- **Plan skills development activities**
- **Implement your development plans and practice your skills**
- **Document and market your skills for best success**

For more information on the Toolkit, visit the Conference Board's website above.

Questions such as these will also help you with your career development competencies, and you will get to know whether or not you really want to work in a particular occupation, given the skills and abilities you have developed and enjoy using.

Decide how well you use these skills yourself. Think about times when you have really been able to excel at using each skill and times when you wish you had been a little better. Ask yourself if you think you have completely mastered this skill, have somewhat mastered it, or whether you need to improve it a great deal.

Find examples in your own life experiences where you have used each skill well. You can begin to use those examples as a foundation on which to build your repertoire of skills as well as your ability to talk about their use. Keep a record in some way such as a journal or notes for a portfolio so that you can draw upon your experiences and examples when you need them. Being able to talk about how you use these skills and feeling confident enough to give examples will be an advantage to you when preparing for an interview or creating a skills portfolio.

Today many employers want to know that their prospective employees have the ability to solve problems and think quickly on their feet and not reply with an "I don't know" attitude. If you have put together a few examples of when you have used your problem-solving abilities or showed how flexible you are, you will be able to give those examples when asked what you might do in a situation, instead of saying, "I never really thought about that before."

Identify those employability skills which you feel need improvement. Develop a plan for their improvement and remember that you can improve these skills on an almost daily basis throughout your life. You probably already have more skills than you realize. You have multiple opportunities to enhance these skills while working, while pursuing educational opportunities, while living your life. That is why these are often called transferable skills.

If you can solve problems in one area of your life, chances are you will be able to solve them in other areas as well. If you are flexible when the weather changes just as you were going camping, chances are you will be flexible when your supervisor asks you to adjust the seating arrangement in the restaurant to accommodate six new customers. Or at least, by knowing that you are flexible in one situation, you can remind yourself to apply that ability to another situation.

Ask the question, "What does it look like?" when you think about these skills. What would you see yourself (and/or others) doing when you are performing this skill? If you have trouble answering this question, look for ways to expand your knowledge of these skills in action. Look at the bulleted points under each heading on the *Employability Skills 2000+* list to get ideas of what kinds of activities to look for. There are also some expanded descriptions of these skills in Appendix D (see the text box). The groupings are slightly different, but you will be able to find most of these skills within that list as well.

Realize that these skills can not and do not operate in isolation. They all need a context in which to be performed. You can't show your computer skills if you don't have any specific content to use; you can't show your writing skills if you don't have a subject about which to write; you can't demonstrate your ability at working with others if you don't have a project with some content to work on with someone; a problem doesn't exist without a situation - you need to have a problem to solve or decisions to make about a specific topic.

Therefore you should be attempting to learn and improve these skills *at the same time* as you are learning other things, taking courses, working at jobs, and going through your daily life. They cannot exist without the context or setting in which to use them.

More Skills Descriptions: Blueprint Appendix D

The *Blueprint for Life/Work Designs, Appendix D,* at http://www.lifework.ca/pr_blueprint.htm, Links Between Blueprint Competencies and Other Skills Frameworks, will give you further explanations of what Employability Skills "look like." Descriptions are grouped under the headings of:

- **Oral Communication**
- **Listening Skills**
- **Non-Verbal Communication**
- **Reading**
- **Writing**
- **Critical Thinking Skills (includes Problem Solving and Decision Making)**
- **Creativity**
- **Continuous Learning or Willingness to Learn**
- **Numeracy**
- **Computer Skills**
- **Teamwork Skills**
- **Personal Management Skills**
- **Self-Esteem and Confidence**
- **Responsibility and Accountability**
- **Initiative**
- **Quality Work**
- **Ethics**
- **Flexibility and Adaptability**
- **Stress Management**

HRDC's Essential Skills Research Project

The Essential Skills Research Project, undertaken by Human Resources Development Canada in the 1990s, builds on the Employability Skills work from the Conference Board of Canada. The Project involved interviewing more than 3,000 working people across Canada looking at the following skills in greater detail:

- Reading Text
- Document Use
- Writing
- Numeracy
- Oral Communication
- Thinking Skills
- Problem Solving
- Decision Making
- Job Task Planning and Organizing
- Significant Use of Memory
- Finding Information
- Working with Others
- Computer Use
- Continuous Learning

The results from the project are compiled into a database which:

- Shows how these skills vary in content and difficulty, depending on the job
- Gives examples of how these skills are used in different jobs
- Provides detailed profiles of the skills requirements of a broad range of specific occupations, including examples of materials used in actual workplace situations.

A searchable database containing the results of the research is located at *http://www15.hrdc-drhc.gc.ca*. This site is constantly being enhanced; it currently shows how Essential Skills are used in approximately 170 occupations at Skill Levels C and D levels of the National Occupational Classification system (see pages 590-595 for more information on how Skill Level is defined).

You can search the database in the following ways:

- **Applications**: For example, "I want to know how I can use the Essential Skills information." (As a teacher, career counsellor, parent, etc.)
- **Occupation**: For example, "I want to know how dental assistants use Essential Skills."
- **Key Word(s)**: For example, "I want to know which occupations use (or don't use) 'geometry'."
- **Most Important Skill(s)**: For example, "In which occupations is problem solving one of the most important Essential Skills?"
- **Skills**: For example, "Which occupations involve complex writing tasks?"
- **Advanced Search**: For example, "I want to gather information across occupations and/or skills."

Internet Resources to Support the Development of Skills

Blueprint for Life/Work Designs:
http://www.lifework.ca/pr_blueprint.htm
Produced by the National Life Work Centre, this resource is designed for career practitioners. It provides a framework of the career development competencies required by Canadians from elementary school through adulthood.

Appendix D: Skills Frameworks:
http://lifework.ca/blue_2000/pr_blue_draft.htm
From the Blueprint, an overview of how to define and identify skills. Includes information about Employability and Essential Skills, Multiple Intelligences, Emotional Intelligence as well as a comprehensive skills checklist. This is Appendix D of the *Blueprint for Life/Work Designs* and is in PDF format.

Employability Skills for British Columbia:
http://www.aett.gov.bc.ca/employability
A report on the research undertaken with small and medium sized employers in B.C. to identify the skills most sought by recruiters. The skills list is available (Page 28) as well as the report.

Essential Skills Profiles Database:
http://www15.hrdc-drhc.gc.ca
This site gives an overview of the HRDC Essential Skills Project and describes how Essential Skills are used in 170 occupations, mainly at the C and D levels of the NOC. This searchable database is frequently updated.

Canada/B.C. Business Service Centre:
http://www.sb.gov.bc.ca/smallbus/sbhome.htm
Excellent information for anyone interested in starting a small business in British Columbia.

e-START:
http://strategis.ic.gc.ca/e-start.ca
Developed by Industry Canada and ACE-Canada, this site is especially for post secondary students with an interest in entrepreneurship

Realm:
http://realm.net
This lively webzine is for young Canadians interested in creating their own work through self-employment

tion, instead of saying, "I never really thought about that before."

Identify those employability skills which you feel need improvement. Develop a plan for their improvement and remember that you can improve these skills on an almost daily basis throughout your life. You probably already have more skills than you realize. You have multiple opportunities to enhance these skills while working, while pursuing educational opportunities, while living your life. That is why these are often called transferable skills.

If you can solve problems in one area of your life, chances are you will be able to solve them in other areas as well. If you are flexible when the weather changes just as you were going camping, chances are you will be flexible when your supervisor asks you to adjust the seating arrangement in the restaurant to accommodate six new customers. Or at least, by knowing that you are flexible in one situation, you can remind yourself to apply that ability to another situation.

Ask the question, "What does it look like?" when you think about these skills. What would you see yourself (and/or others) doing when you are performing this skill? If you have trouble answering this question, look for ways to expand your knowledge of these skills in action. Look at the bulleted points under each heading on the *Employability Skills 2000+* list to get ideas of what kinds of activities to look for. There are also some expanded descriptions of these skills in Appendix D (see the text box). The groupings are slightly different, but you will be able to find most of these skills within that list as well.

Realize that these skills can not and do not operate in isolation. They all need a context in which to be performed. You can't show your computer skills if you don't have any specific content to use; you can't show your writing skills if you don't have a subject about which to write; you can't demonstrate your ability at working with others if you don't have a project with some content to work on with someone; a problem doesn't exist without a situation - you need to have a problem to solve or decisions to make about a specific topic.

Therefore you should be attempting to learn and improve these skills *at the same time* as you are learning other things, taking courses, working at jobs, and going through your daily life. They cannot exist without the context or setting in which to use them.

More Skills Descriptions: Blueprint Appendix D

The *Blueprint for Life/Work Designs, Appendix D*, at http://www.lifework.ca/pr_blueprint.htm, Links Between Blueprint Competencies and Other Skills Frameworks, will give you further explanations of what Employability Skills "look like." Descriptions are grouped under the headings of:

- **Oral Communication**
- **Listening Skills**
- **Non-Verbal Communication**
- **Reading**
- **Writing**
- **Critical Thinking Skills (includes Problem Solving and Decision Making)**
- **Creativity**
- **Continuous Learning or Willingness to Learn**
- **Numeracy**
- **Computer Skills**
- **Teamwork Skills**
- **Personal Management Skills**
- **Self-Esteem and Confidence**
- **Responsibility and Accountability**
- **Initiative**
- **Quality Work**
- **Ethics**
- **Flexibility and Adaptability**
- **Stress Management**

HRDC's Essential Skills Research Project

The Essential Skills Research Project, undertaken by Human Resources Development Canada in the 1990s, builds on the Employability Skills work from the Conference Board of Canada. The Project involved interviewing more than 3,000 working people across Canada looking at the following skills in greater detail:

- Reading Text
- Document Use
- Writing
- Numeracy
- Oral Communication
- Thinking Skills
- Problem Solving
- Decision Making
- Job Task Planning and Organizing
- Significant Use of Memory
- Finding Information
- Working with Others
- Computer Use
- Continuous Learning

The results from the project are compiled into a database which:

- Shows how these skills vary in content and difficulty, depending on the job
- Gives examples of how these skills are used in different jobs
- Provides detailed profiles of the skills requirements of a broad range of specific occupations, including examples of materials used in actual workplace situations.

A searchable database containing the results of the research is located at *http://www15.hrdc-drhc.gc.ca*. This site is constantly being enhanced; it currently shows how Essential Skills are used in approximately 170 occupations at Skill Levels C and D levels of the National Occupational Classification system (see pages 590-595 for more information on how Skill Level is defined).

You can search the database in the following ways:

- **Applications**: For example, "I want to know how I can use the Essential Skills information." (As a teacher, career counsellor, parent, etc.)
- **Occupation**: For example, "I want to know how dental assistants use Essential Skills."
- **Key Word(s)**: For example, "I want to know which occupations use (or don't use) 'geometry'."
- **Most Important Skill(s)**: For example, "In which occupations is problem solving one of the most important Essential Skills?"
- **Skills**: For example, "Which occupations involve complex writing tasks?"
- **Advanced Search**: For example, "I want to gather information across occupations and or skills."

Internet Resources to Support the Development of Skills

Blueprint for Life/Work Designs:
http://www.lifework.ca/pr_blueprint.htm
Produced by the National Life Work Centre, this resource is designed for career practitioners. It provides a framework of the career development competencies required by Canadians from elementary school through adulthood.

Appendix D: Skills Frameworks:
http://lifework.ca/blue_2000/pr_blue_draft.htm
From the Blueprint, an overview of how to define and identify skills. Includes information about Employability and Essential Skills, Multiple Intelligences, Emotional Intelligence as well as a comprehensive skills checklist. This is Appendix D of the *Blueprint for Life/Work Designs* and is in PDF format.

Employability Skills for British Columbia:
http://www.aett.gov.bc.ca/employability
A report on the research undertaken with small and medium sized employers in B.C. to identify the skills most sought by recruiters. The skills list is available (Page 28) as well as the report.

Essential Skills Profiles Database:
http://www15.hrdc-drhc.gc.ca
This site gives an overview of the HRDC Essential Skills Project and describes how Essential Skills are used in 170 occupations, mainly at the C and D levels of the NOC. This searchable database is frequently updated.

Canada/B.C. Business Service Centre:
http://www.sb.gov.bc.ca/smallbus/sbhome.htm
Excellent information for anyone interested in starting a small business in British Columbia.

e-START:
http://strategis.ic.gc.ca/e-start.ca
Developed by Industry Canada and ACE-Canada, this site is especially for post secondary students with an interest in entrepreneurship

Realm:
http://realm.net
This lively webzine is for young Canadians interested in creating their own work through self-employment

4. GENERAL CAREER INFORMATION RESOURCES

Besides all the online Internet resources listed in the previous sections, there are many public, semi-public and private organizations throughout the province which provide information to help you explore and decide upon career choices. In addition to the Regional Colleges listed in Appendix C (most of which have Counselling Services), one or more of the following may also be of assistance to you.

1. **Human Resource Centres of Canada**
   Human Resource Centres in the province all offer a standard range of services. These include Employment Insurance benefits and employment assistance through counselling, labour market information, and support for people who are trying to enter or change their attachment to the labour market. In some communities, local partnerships have been formed to provide specific services such as in-depth counselling or training.

   In addition, HRC's for Students ("Hire-a-Student") operate in spring and summer and all year round in some communities. These offices are specially organized to assist returning students obtain summer employment and can be a valuable source of information about the local labour market. (*http://hrdc-drhc.gc.ca*).

2. **B.C. Ministry of Social Development and Economic Security - Employment Services Centres**
   Employment Services Centres across the province provide information and services to eligible clients about ministry-funded programs, including vocational rehabilitation services, industrial adjustment services (for employers), training and employability programs, and youth programs. For contact information, check the Ministry's website (*http://www.gov.bc.ca/sdes*) or the Blue Pages of your phone book.

3. **Industry Training and Apprenticeship Commission (ITAC)**
   ITAC Field Services offices are found throughout the province. Apprenticeship counsellors are available to answer questions about trades qualifications in B.C. Check the Blue Pages or the website (*http://www.itac.gov.bc.ca*) for contact information for the centre nearest you. Also see the Appendix on Apprenticeship in this publication on pages 597-599.

4. **Ministry of Advanced Education, Training and Technology - Community Skills Centres**
   Community Skills Centres are located in a number of communities within the province. They offer a wide range of services which include providing access to the Internet, local labour market information, and information about skills upgrading available through a variety of education and training providers in the community. Note that not all services are available at every Skills Centre. Check the Blue Pages or the CSC website (*http://www.skills.bc.ca*) for contact information.

5. **Career Resource Centres**
   These types of centres are located in secondary schools, post-secondary institutions (colleges, university colleges and universities), employment agencies, and non-profit organizations. Services vary and can often be focused on specific groups, e.g., youth and First Nations.

6. **Libraries**
   The availability of occupational information that can be found at a public library varies from branch to branch. At most branches, it is best to ask for direction at the reference desk. The librarian in attendance can help narrow the focus of a search and advise how to gain access to specific information more directly.

   For career planners living in the Lower Mainland, the Central Branch of the Vancouver Public Library has the greatest volume of career information of any library in the province. Career information is readily available at the Career Collection shelf in the Business and Economics Division of that branch. Check with the librarian at the Business and Economics Reference Desk for assistance in finding the information you need. Also inquire about any special career information services the library offers.

   For those who are interested in the occupations and employment prospects south of the border, there are also a number of helpful reference publications from the United States, including the *Occupational Outlook Handbook* (*http://www.bls.gov/ocohome.htm*).

7. **Professional and comparable occupation-specific organizations**
   The occupation-specific text in this book contains many references to professional and occupational bodies offering employment-related information. Otherwise, consult the telephone book or call one of the previously mentioned agencies.

8. **Computerized career decision-making programs**
   Such programs are available at high schools, colleges, employment agencies, and some libraries.

5. INFORMATION TECHNOLOGY

What is IT?

Information Technology (IT) is the study, design, development, implementation, support or management of computer-based information systems. The influence of IT pervades nearly all industries and sectors in our economy. IT is also an umbrella term to identify those industries that produce specific information technology goods and services. Examples of IT industries include computer and related services such as software development or computer business consulting services. It also includes manufacturing of computer and IT related equipment such as computer parts and components.

The IT sector itself is a significant part of the larger *High Technology* or *High Tech sector*. This sector includes IT industries such as computer services and computer manufacturing, but it also includes other high technology-based enterprises such as telecommunications and engineering firms, medical laboratories, aircraft manufacturing and maintenance, and pharmaceutical manufacturing and development. A high proportion of employment in all the firms in the larger *High Tech* sector are in IT related occupations.

IT in British Columbia

While the *High Tech* sector made up only about 3% of the B.C. Gross Domestic Product in 1998, it accounted for 17% of the overall job growth for that year. Employment in the *High Tech* sector doubled in the 1990s. The Canadian Occupational Projection System (COPS) projects that the IT sector, within high technology, will see 24,000 new jobs created between 1998-2008. This level of job creation represents much faster than average employment growth when compared to the B.C. economy as a whole.

In 1999 there were 7,349 *High Tech* businesses in B.C., up 7.4% from 6,843 in 1998, according to a recent study by BCStats. The *Computer and Related Services* industry made up about one-third of *High Tech* establishments.

Within the *High Tech* sector, self-employment and small businesses are common. An estimated 70% of businesses in the *Computer and Related Services* industry employ five or fewer workers compared to the B.C. average of 59%. This has implications for skill level requirements in jobs available in the IT sector. Small companies require broadly educated and flexible IT workers who are continually in a learning mode and keep their skills up to date.

Across Canada and in B.C. the IT sector is experiencing shortages of skilled workers. The labour shortage in B.C. appears to be concentrated at the higher skill level. There is particularly strong demand for those workers that possess both high level technical knowledge and managerial skill expertise.

IT workers, in addition to being highly educated, tend to be passionate about their work. They may spend their free time teaching themselves new programming skills and may put their skills to practice through activities such as developing their own computer games or websites.

Two-thirds (65%) of high technology firms are located in the Southwest/Lower Mainland of B.C. Vancouver Island and Coast is the second largest home of high technology firms with 17%. The Thompson-Okanagan IT sector is growing rapidly and makes up another 9% of the high technology firms. The remaining 9% of high tech firms are scattered throughout the rest of the province.

IT Occupations in *Work Futures*

The field of information technology is constantly changing and being re-defined by new technologies. As a result, the IT-related occupations themselves are also subject to much change and re-defining. Within the current National Occupational Classification (NOC) system, IT occupations are classified under existing and more traditional occupations. New and emerging IT occupations are necessarily considered within other related occupations of the existing structure. To further complicate this, some newly created IT occupations, such as interactive media developers, may include elements of two or more existing occupational groups under the current NOC (2163, Computer Programmers and 5241, Graphic Designers and Illustrating Artists, or alternatively 2163 Computer Programmers and 5225, Audio and Video Recording Technicians) as well as some completely new competencies not found in the NOC. When new occupations are not included in the NOC, it is difficult to get specific statistics on them. They cannot be incorporated into the Canadian Occupational Projection System (COPS). COPS provides the basis for the employment prospects within the occupational profiles. For example, as interactive media developer straddles two or more NOC occupations, there is no data collected specifically on this emerging occupation by Statistics Canada and it cannot be included in COPS.

The end result is that the structure of the NOC determines the occupational profiles that can be included in *Work Futures*. Within the occupational profiles there is discussion about new technologies as well as emerging IT occupations or specializations. These are discussed under the occupational profiles that are most closely related to existing NOC occupations. The outcome is that some newly created occupations may only be briefly highlighted or may not be discussed within the occupational profiles.

This section on emerging occupations is intended to highlight some of these major occupational changes, new occupations and trends. A revision of the NOC will include the new occupations discussed in this section.

Many IT or computer-related jobs are already covered under the existing NOC occupational groupings in *Work Futures*. Occupations covered in existing groupings include:

- Computer retail salespeople are covered in Retail Sales Clerks (6421)
- Marketing managers, computer retail sales managers, and information systems and data processing managers are described in Middle and Other Managers (01)
- Computer wholesale sales specialists and representatives are covered in Technical Sales Specialists, Wholesale Trade (6221)
- Technical writers and content developers are covered in Writers (512)
- Computer software and hardware engineers are covered in Other Engineers (214)
- Call centre employees are covered in Library, Correspondence and related Information Clerks (145)
- Data entry clerks, and computer operators are covered in Office Equipment Operators (1422)
- Computer Systems Analysts (2162)
- Computer Programmers (2163)
- Graphic Designers are covered in Creative Designers and Craftpersons (524)
- Electronic Services Technicians (2242)

Newly Created IT Occupations

There are three broad categories of newly created IT positions that are not adequately covered in the *Work Futures* occupational profiles. These are web-based occupations, database and software engineering occupations, and systems-related occupations.

Web-based Occupations

Web-based occupations relate to the technology of the World Wide Web (WWW). The WWW is a subset of the Internet, which allows users to find and view documents stored on Internet-connected computers using hypertext language and protocols. Organizations also develop their own private Intranets that use the same principles but limit access to users in their organization. It is estimated that the WWW currently contains two billion pages of information, and this number is expected to grow to four billion by 2001.

Web managers (also known as webmasters) plan, organize and control the design, development and maintenance of an organization's website on the Internet or Intranet. They may work alone taking care of all the technical aspects and content development for the website, or they may supervise others who perform these duties.

Web managers come from a variety of backgrounds, including computer programming, marketing, writing and graphic design, as a composite of these skills is required for web managers. This is generally not an entry-level position, as most employers prefer at least two years of related experience. As the WWW grows, so too will demand for workers in this occupation. Employers are currently having difficulty recruiting web managers because the position requires both technical and managerial skills.

Web technicians set up and maintain Internet and Intranet websites and web server hardware and software. They monitor and optimize network connectivity and performance. They also provide user support for electronic (e-mail) systems and help users post content to websites.

Like web managers, web technicians come from a wide variety of backgrounds. The minimum employment requirements include knowledge and experience with web technologies, and many employers prefer some formal education such as a diploma from a technical institute. Since web technicians are involved in helping others to use the Internet they need excellent customer service skills and the ability to explain complex technical aspects of the Internet in plain language. As websites become more technically complex and use more database and multimedia technologies, web technicians will need to broaden their skills to encompass these technologies. Some web technicians are required to be on-call 24 hours a day to ensure that websites are up and functioning at all times.

Web designers create, develop and maintain Internet and Intranet websites. They consult with clients to establish the nature and content of the website and design the website from those specifications.

Most web designers have some formal post-secondary education and employers prefer candidates with a degree or diploma in fine arts, graphic design, or communications. Since web design is related to graphic design, related experience in print, photography, animation or information design may be considered a substitute for web-specific experience. Similar to web technicians, web designers must be able to explain technical and graphical aspects of web design in plain language. Web designers use their excellent communication skills both in discovering what clients' desires are, and translating those desires into an appealing and functional website.

Database and Software Engineering Occupations

Databases allow users to store, sort and extract information in an electronic format. Databases also allow for information sharing through networked computers or, to a broader audience, through the Internet. Database-related occupations are involved in the design, development, and maintenance of databases. Software is a program that controls computer hardware. The two varieties of software are systems software which control the operation of a computer system, and application software which allows a user to perform specific t0asks such as word processing.

Database and Data Adminisrators design, develop and operate database management systems and develop and implement data administration policy and standards. Database administrators (also known as DBAs) handle the more technical aspects of databases and design and construct databases that meet client needs. Data Administrators are more involved in developing policies and standards around user access and utilization of databases as well as establishing guidelines for information design within databases.

Database and data administrators require a Bachelor of Science (BSc) degree in computer science and at least three years' experience in computer programming and/or data administration. Some employers require or prefer candidates with specific vendor certification. In addition to strong computer programming skills and extensive knowledge and experience with database software packages, database and data administrators need strong communication skills to train non-technical users on databases that they have designed. As Internet technology allows databases to be placed on the World Wide Web, access to and security of these databases will become increasingly important to workers in this occupation.

Software engineers and technical architects' plan, design, develop, and modify software applications, technical environments, and information warehouses, operating systems and telecommunications software. They collect users' requirements and design or modify computer and telecommunications software to fit user specifications. Many workers in this occupation are self-employed or work for consulting firms.

A Bachelor of Science (BSc) degree in computer science, computer engineering, or mathematics is generally required. As this is not an entry-level position, experience as a computer programmer or systems analyst is required. Since software engineers and technical architects must also be able to research and price options for clients, some employers prefer business courses in accounting and management in addition to the technical education for the job.

Interactive media developers develop and program software that creates and manipulates digital images, animation, audio, and special effects used in computer-based training software, computer games, film, video, internet applications and other interactive media. This broad occupational grouping includes both sound and visual programmers, ranging from code writers or debuggers to those who are able to use artificial intelligence (IA) to enhance computer programs.

Given this broad range of activities, it is not surprising that educational requirements are also quite broad ranging from two-year diploma programs in interactive media programming up to doctoral degrees in computer science. Many workers in this field also have artistic ability and may have educational backgrounds that include a degrees in fine arts in either music or visual arts. Mathematical ability, particularly with vector mathematics that allows for manipulation of two- and three-dimensional objects, is critical to advancement in this occupation. Computer game and educational software development companies are the primary employers of interactive media developers in B.C., however, with the growth of the film industry in B.C. more interactive media developers may be required to develop special effects for films.

Systems Operations Occupations

System networks are a number of computers and devices (such as printers and modems) joined together by a physical communications link. Networks allow users to share data and applications that are stored on a server computer. When all of the users are located in one office or building, the system is called a Local Area Network (LAN), while geographically diverse users linked to a single server are linked via a Wide Area Network (WAN). Systems operations workers set up and maintain the system, and help users who are connected to the network.

Systems operations specialists plan, develop, and optimize the capacity and performance of information and communication system networks. They document user needs for the system and are in charge of purchasing the system components and implementing the set up of the system. They troubleshoot, maintain and upgrade the computer operating system or telecommunication system. They are in charge of developing policies and procedures for network access and use, and they often supervise junior computer and network operators.

Although some workers in this field have only a high school diploma, most employers prefer a Bachelor of Science (BSc) degree in computer science with related experience in computer programming or systems analysis. Workers in this occupation must have excellent knowledge of computer networking systems and have the ability to analyze user needs, and design and implement a system that meets those needs. Systems operations specialists may work within an organization or for a computer or telecommunications consulting firm.

Computer and network operators operate computer equipment, produce computer-generated reports, and monitor the operation of computer systems and networks. They install, maintain and troubleshoot operating systems, communications equipment and computer hardware. They operate master consoles to monitor the performance of computer systems, and provide problem-solving and technical support to computer and network users.

There is a range of educational backgrounds in this position ranging from a high school diploma with related experience to a Bachelor of Science (BSc) degree in computer science. Most employers prefer candidates with at least a college or technical institute diploma in computer networking and support. Creative problem solving and the ability to communicate technical aspects of computers to non-technical users are important skills for workers in this occupation. Workers must also display good customer service skills.

User and technical support analysts assist with the set-up and basic operation of their computer equipment. They may work within an organization, or may provide call centre support to external clients who have purchased their employer's hardware or software. They receive queries from clients who are experiencing computer problems and answer these queries directly, or refer the client to a specialist who can help the client.

Formal education requirements range from high school graduation to Bachelor of Science (BSc) degree. Most employers require candidates to have taken some technical courses, and prefer candidates with a diploma or certificate in computer support. This occupation can be a stepping stone to other work such as computer systems analyst or operations specialist. Communication skills are very important for user and technical support analysts, as they must explain technical aspects in non-technical language to users who may be frustrated or angry at their computers. In smaller organizations workers in this occupation may be called upon to work in other capacities such as advising on the purchase of computer equipment, or programming a website.

Systems testers develop, document and execute test plans to evaluate the performance of software applications and information and telecommunications systems. They also review and advise on end-user needs in the design and development of systems. They may work for a software or hardware developer, or work within an organization to enhance systems performance.

Generally a Bachelor of Science (BSc) in computer science, engineering, or mathematics is required for this position. At the entry level, some employers accept a college diploma or certificate in electrical engineering or computer studies, or significant experience with the system or product that the worker will be in charge of testing. In addition to expert-level knowledge of the system or product, systems testers must also have experience with test scripts and knowledge of information design and layout. As consumers become more comfortable with computer technology, more emphasis will likely be placed on assuring the quality and usability of computer systems and products, ensuring good prospects for workers in this occupation.

©Stone/Vancouver

0 - MANAGEMENT OCCUPATIONS

00 Senior Management Occupations 38
01-09 Middle and Other Management 40

Senior Management Occupations

NOC 00

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	17,300	16,540	20,630

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
4,090	3,680	7,770

Annual Growth 1998-2008 2.2%

Main Industries of Employment

Wholesale Trade	11%
Finance, Insurance, and Real Estate	9%
Retail Trade	7%

Employment by Region

Lower Mainland	69%
Vancouver Island	16%
Northern B.C.	6%
Okanagan/Kootenay	10%

Self-employment 37%

Nature of the Work

This occupational group includes *legislators* as well as *senior managers* from all industries including government. These are not entry-level occupations, and people who are successful at attaining this level typically have progressed through positions of increasing responsibility.

Generally, they all plan, organize, direct and control the major activities of government, companies or other organizations. They also formulate government or corporate policy directions. Most senior managers are directed by boards of directors, but in some organizations they manage independently.

Legislators, or *elected representatives,* work in a federal, provincial, territorial or local (municipal) government legislative body. This group also includes elected or appointed representatives for other organizations, including school boards and native band councils. Note that those who have a primary occupation other than legislator would not be included in this group for statistical purposes.

Senior government managers work in all levels of government, as well as boards, agencies or commissions, which are directed by elected representatives or legislative bodies.

Senior financial, communication, and *business services managers* work in the finance, communications and business services industries.

Senior managers in *health, education, social* and *community services* work in hospitals, colleges, unions, professional associations and other organizations, associations or institutions that deliver health, education, social or community services.

Senior managers in *trade, broadcasting* and *tourism* work in the retail or wholesale trade, broadcasting, food and beverage services, and accommodation industries as well as other business service companies not elsewhere classified.

Senior managers in *manufacturing, utilities, transportation* and *construction* work in these related industries.

Main Duties

Legislators enact, amend or repeal laws and regulations. They respond to concerns of their constituents or of the general public. They may serve as ministers and direct senior government managers in the management of a department or agency.

Senior government managers establish organization objectives and formulate or approve programs and procedures. They advise legislators on policy questions and refer major policy matters to them for final decisions. They are responsible for budget management, coordinating department activities with other senior government managers and presenting information to legislative committees and others.

Senior managers in other industries establish objectives for their company, organization or association. They formulate or approve policies and programs. As the whole organization is their responsibility, they authorize and organize the establishment of major departments and associated senior staff positions. They allocate funds to programs, establish financial and administrative controls, formulate and approve promotion campaigns, and approve overall human resources planning. They select or approve the selection of middle managers, directors or other executive staff. They may also represent the organization in negotiations or other functions.

Example Titles

legislators for whom this is a primary occupation (0011):

- city councillor
- mayor
- member of legislative assembly
- member of parliament
- native band chief
- school board trustee
- senator

senior managers in government (0012):

- *assistant deputy minister*
- chief administrative officer
- city administrator
- commission chairperson
- deputy minister
- director general
- executive director

senior managers in other industries (0013 - 0016):

- chairperson
- chief executive officer (CEO)
- chief financial officer (CFO)
- chief operating officer

- deputy chief executive officer
- executive director
- executive vice-president
- general manager
- president
- publisher
- regional vice-president
- vice-president

Education and Training

Typically *senior managers* and *executive officers* work their way into positions of greater responsibility, acquiring first-hand knowledge of an organization and industry operations and investing in special training and experience over a period of 10 years or more. Senior management positions usually require university graduation in arts, sciences, social sciences, engineering or education, depending on the industry setting. An undergraduate degree is typical, and in many instances a graduate degree as well as specialized training in business and management increasingly is required. University colleges and public universities throughout B.C. offer a wide range of degree programs that provide the educational foundation for occupations in management.

Senior managers and executive officers must be able to assess rapidly large amounts of information and to keep their organization or company competitive by enabling it to adapt to changing markets and developing markets. They must have excellent written and oral communication skills, and advanced analytical and negotiating skills in order to organize effectively and direct the organization or company. Planning, coordinating and marketing skills are essential, as are strong computer skills and ongoing education regarding the advancement of technology.

Working Conditions

Legislators and *senior managers* work in offices, often in very comfortable surroundings. While office hours are generally Monday to Friday, 8:00 am to 5:00 p.m., they often work outside of these hours and may work considerably more than a 40-hour week.

Earnings in this occupational group are much higher than the average for all workers, reflecting the experience, responsibility and education that these workers have. The average annual earnings for all workers in this group were $72,800 in 1995. Annual income was slightly higher for those who worked full time over the full year, at $82,700. The respective all-occupation averages in the province in 1995 were $27,900 and $39,400. However, earnings do vary considerably within this group. In particular, there is a striking difference between the earnings of men and women in this occupational group. Men working full time over the full year averaged $89,400, compared to $52,800 for women.

There is also a striking difference among the occupations within this group. The highest earnings were among senior managers in manufacturing, utilities, transportation and construction. They earned on average $94,200 for full-time, full-year work. By comparison, senior managers in finance, communications and other business services earned $89,200, and senior managers in government earned $62,600. Those in health, education, social and community service earned $64,700, and those in trade, broadcasting and tourism earned $89,800. Of this occupational group, legislators earned the least for full-time, full-year work ($36,200).

This a very large occupational group, despite the fact that the number of workers dropped from 17,300 in 1990 to 16,540 in 1998.

Over one-third of the workers in this occupational group are self-employed, compared to the workforce average of about 15%. The exceptions to this are legislators and senior government managers, none of whom is self-employed. As well, a lower than average share of senior managers in health, education, social and community services are self-employed.

Given the responsibilities of workers in this group, it is not surprising that the proportion of part-time workers is lower than the workforce average. Only 10% work part time, compared to 26% for the workforce as a whole. Legislators are an exception to this, with just over one-third working part time. These statistics only include workers whose main jobs are elected positions, but many elected officials keep their jobs in other fields. For example, most town councillors have other jobs and carry out their legislative duties as a second or part-time job.

Unemployment is very low for this group, and seasonal fluctuations in employment are not an issue. Employment is less sensitive to economic conditions than in other occupations. This reflects the nature of the work and the fact that senior managers are found across all industries with little concentration in any one.

A greater than average share of this group work in the Lower Mainland (69%), with lower than average shares employed in all other regions of the province. This is most extreme in the case of senior managers in financial, communications and other business services, where 83% of workers are located in the Lower Mainland. The only exception to this trend is among the senior government managers, where 38% live in the Lower Mainland while 30% are located in Greater Victoria.

Women make up a much lower than average share of senior managers (21%). However, there is a striking difference in their representation among the different occupations. Women make up 11% of senior managers in manufacturing, utilities, transportation and construction, and 17% of senior managers in financial, communications and business services. On the other hand, women are represented in proportions close to the workforce average among legislators (39%) and are the same as the average among senior managers in health, education, social and community services (46%).

As these jobs require significant experience, these workers, at an average age of 47, are much older than the workforce average. Over half of those in this occupational group are 45 years of age or older, in contrast to less than one-third for the workforce as a whole. A significant share, over one-fifth (more than double the workforce average), are 55 years or older.

Employment Prospects

This is a very large occupational group, made up of about 16,540 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) Projects employment in this group to grow at an annual rate of 2.2%, faster than the average for all occupations. According to this projection, a total of 7,770 positions will become available from 1998 to 2008. Slightly more than half these openings will result from growth in the number of new positions, and the rest will result from retirements.

It should be noted that although *legislators* are included in this group, they are not included in the projections. They are excluded because their size is too small to make a reliable forecast. Their employment prospects also depend on future political conditions, which have little to do with the historical data that projections are based on. Government analysts do not expect that legislators will see much, if any, growth.

Employment of *senior managers* in *finance, communications* and *other business services* is projected to grow much faster than the average for all occupations and faster than any other occupation in this occupational group. This is primarily a result of growth in the finance, communications and other business services industries, which include computer services companies. Most of these openings will be with smaller organizations, as new, emerging firms are expected to be the source of much of the growth.

Employment levels in all other occupations in this group are projected to grow at about the same rate, faster than the all-occupation average. However, government officials believe that this forecast maybe too high for *senior government managers* and *officials*. As with legislators, continued government restraint will probably result in slow, if any, growth for these professionals.

Despite the faster than average employment growth projected for this group overall, competition for positions in all of these fields will remain high. Competition will be particularly high in industries such as government, where little growth is expected.

These are not entry-level jobs, and those who are interested in these positions should first look at obtaining the appropriate education, usually at the post secondary level and often including a professional designation, such as accounting. They should also be prepared to commit to spending an extended period of time acquiring industry and progressive management experience.

Related Occupations

- related middle managers (in middle and other management 01/09)
- school principals and administrators of elementary and secondary education (in middle and other management 01/09)

Middle and Other Management

NOC 01-09

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	130,840	170,370	213,210

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
42,840	38,790	81,630

Annual Growth 1998-2008 2.3%

Main Industries of Employment	
Retail Trade	23%
Accommodation and Food Services	12%
Finance, Insurance, and Real Estate	9%

Employment by Region	
Lower Mainland	63%
Vancouver Island	17%
Northern B.C.	7%
Okanagan/Kootenay	14%

Self-employment 30%

Nature of the Work

Many of these managerial groups are found throughout all industries and government. However, some are found only in specific industries. For example, health care managers work in hospitals and other parts of the health care industry, while managers in public administration work only in government. There is a great variation not only in the work settings but also in the working conditions among these managerial groups.

These are not entry-level occupations, and people who are successful at attaining this level have typically progressed through positions of increasing responsibility. Post secondary education is also important in order to achieve a position of middle manager. This is reflected in the fact that about three-quarters of today's middle managers have had some form of post secondary education.

Main Duties

Generally, all these managers plan, organize, direct and control the activities of the branch or department for which they are responsible or the business they operate. They also develop and implement policies and systems for their branch or department.

Administrative service managers specialize in financial, human resources or purchasing management. They may manage a combination of these services, which may also include other services, such as security or computer services.

Managers in *financial* and *business services* work primarily in the finance, insurance and real estate industries. They may also work in the credit departments of organizations in any industry or in the business services industry.

©Stone/Vancouver

Managers in *communications* work in telephone, satellite, telecommunications and courier companies, as well as with Canada Post Corporation.

Engineering, architecture, science and *information systems managers* work in government and a wide range of private sector organizations. They may manage engineering consulting and scientific research companies and architectural firms, or they may manage related departments or laboratories.

Managers in *health, education, social* and *community services* work in hospitals and other health care institutions, educational institutions, social service and community agencies and correctional facilities.

Managers in *public administration* work in all levels of government, in government agencies and in legislative bodies. They manage policy and administration in health, social services, economic analysis, taxation or education.

Managers in *art, culture, recreation* and *sport* work in organizations in these industries. This includes library, archive, museum and art gallery managers. It also includes managers in publishing, motion pictures, TV, radio and performing arts, as well as recreation and sport programs and services.

Managers in *sales* and *service* work in a range of service industries, including retail trade, food services, accommodation, protective services and personal services. Included in this group also are sales, marketing and advertising managers who may work in any industry.

Managers in *construction* and *transportation* primarily work in the construction and transportation industries. Transportation managers may also work in the transportation departments in the retail trade, manufacturing and utilities industries.

Facility operation and *maintenance managers* work in a wide range of industries. They manage large buildings or facilities, including airports, harbours, warehouses, shopping malls, office buildings, sports facilities and colleges.

Managers in *primary production* include those managers who work in what are called primary industries. These are resource-based and include forestry and logging, mining, oil and gas, and fishing.

Managers in *manufacturing* and *utilities* generally work in the manufacturing industry, including wood, pulp, paper, mineral, food and beverage manufacturing, or for electric power or water utilities.

Example Titles

administrative services managers (011):
- controller
- financial manager
- human resources manager
- purchasing manager

managers in financial and business services (012):
- bank manager
- credit manager
- insurance manager
- manager, market research service
- mortgage brokerage manager
- payroll service manager
- real estate manager
- securities manager

managers in communications (except broadcasting (013):
- courier service manager
- director, switching system
- network operations manager
- post office manager
- telecommunications manager

managers in engineering, architecture, science and information systems (021):
- architectural manager
- computer systems manager
- data centre manager
- director, management information systems
- director of research, forestry
- engineering department manager
- web manager

managers in health, education, social and community services (031):
- chief of medical staff
- dean
- detention centre director
- director of nursing
- director, community centre
- manager, business school
- principal
- registrar
- school district superintendent

managers in public administration (041):
- chief, economic analysis
- city medical health officer
- director, curriculum development
- director, school inspections
- social services director
- taxation manager

managers in art, culture recreation and sport (051):
- art gallery manager
- chief librarian
- director of recreation
- managing editor
- radio programming manager
- sports association director

managers in sales and service (061-065):
- advertising director
- antique dealer
- commissioned officer, armed forces
- department store manager
- deputy fire chief
- front desk manager

hotel food and beverage service manager
- marketing manager
- motel manager
- police lieutenant
- regional sales manager
- restaurant manager
- ski resort manager
- travel agency manager

managers in construction and transportation (071):
- construction managers
- freight forwarding manager
- general contractor
- home renovator
- railway superintendent
- traffic manager

facility operation and maintenance managers (072):
- head, facilities management
- marina manager
- plant maintenance superintendent
- shopping mall manager
- warehouse manager

managers in primary production (except agriculture) (081):
- director of mining
- forest operations manager
- mine manager
- shore captain, fishing

managers in manufacturing and utilities (091):
- dairy plant manager
- electric power plant manager
- foundry manager
- manager, gas supply operations
- paper mill manager
- printing plant manager
- water filtration plant manager

Education and Training

Managerial positions are usually achieved after many years of work in a particular industry. Most people who enter management have above average educational qualifications. Typical credentials may be an undergraduate degree in arts, science, engineering or education, followed by specialized business or management courses.

Public colleges and universities in B.C. offer a range of degree programs that may, in time, lead to this management level. Formal training in administration may be required, and many institutions offer programs specifically designed to impart management and administration skills. For example, Simon Fraser University offers a master's degree in Administrative Leadership and Royal Roads University offers a bachelor of commerce degree in Entrepreneurial Management. There are also many non-credit, part-time management and professional upgrading courses offered by community colleges and university colleges in B.C.

In general managerial positions require an ability to supervise and coordinate staff and activities, which requires good organizational and communication skills. Good planning and analytical skills and problem-solving abilities are needed. An ability to develop and implement policies, monitor quality control, develop niche markets and control inventories may be necessary. Personal qualities that are important in these careers include leadership ability, a desire to serve others, an ability to relate to other professionals and a capacity to work well under pressure. Good written and oral communication skills as well as an ability to deal with change and technology are assets.

Working Conditions

While most managers work primarily in offices, many are found in a wide range of other settings, including building sites, laboratories, hospitals, retail stores, pulp mills, wood manufacturing plants, mines and correctional facilities. Managers sometimes work beyond the regular hours of work for their industry.

Earnings for middle managers are higher than the average for all workers. The average earnings for all middle managers were $39,900 in 1995. Earnings were slightly higher for those who worked full time over the full year, at $45,600. These earnings are much higher than the provincial averages of $27,900 for all workers and $39,400 for all full-time, full-year workers.

Earnings vary considerably among workers in these occupational groups. Important factors that influence earnings include experience, responsibility and education. Another significant factor that influences earnings is the type of industry. Earnings can also vary significantly within a specific industry.

For example, human resource managers working full time, full year earned an average of $63,600 in 1995. Managers in engineering, architecture, science and information systems had even higher full-time earnings ($63,900). These managers generally have a least one university degree, additional training unique to the industry, and industry experience acquired as they have progressed through positions of increasing responsibility. At the other end of the scale, the lowest paid managers are restaurant and food service managers, who made an average of $29,300 for full-time, full-year work. It should be noted that these earnings figures are averages only, and earnings can vary greatly within many industries. For example, a well-educated and experienced manager of food services in a large hotel can expect to earn much more than the average for restaurant and food service managers.

Middle and *other managers* constitute a very large occupational group. In 1990 there were 130,840 workers, and this grew to 170,370 by 1998.

The largest group in middle management is retail trade managers, who account for 26% of these workers. This is followed by managers in food services and accommodation, at 12%. There are also significant concentrations in the finance, insurance and real estate (9%), construction and transportation (11%), wholesale trade (7%), education (5%) and business services (4%) industries. The remaining middle managers are spread across a variety of industries.

Managers have very high rates of self-employment. These managers are primarily owner-operators. That is, they are people who manage their own business. Nearly one-third of managers are self-employed, compared to 15% for the workforce as a whole. However, the extent of managers' self-employment varies greatly by occupational specialization, industry and geographic location. For example, self-employment is higher among managers outside the Lower Mainland.

By industry, the highest rate of self-employment is in construction, where, for example, 81% of managers in residential home building are self-employed. Managers in the retail trade, accommodation services, food services and other business services also have high rates of self-employment, between 40% and 50%. At the other end of the scale, managers in government, health, education, protective services and banking have self-employment rates of less than 3%.

Given the responsibilities of employees in this group, it isn't surprising that part-time work among these workers is less than the workforce average. Only 9% of individuals in this occupation work part time, compared to 26% for the workforce as a whole.

Unemployment is very low for middle managers, and as a whole, seasonal fluctuations are not an issue. However, in some industries there are more managers who work full time for only part of the year. More than one-quarter of the managers in construction, accommodation, food services, publishing, motion pictures, broadcasting and performing arts, as well as recreation and sport work full time for only part of the year. These are industries where seasonal influences might be a factor in the availability of full-time, full-year work.

The industries with the most middle managers reflect the size of the occupational groups. The largest industry share is in retail trade, followed by the accommodation and food services industry. The construction industry, sales, marketing and advertising, as well as manufacturing and utilities companies, also have large numbers of middle managers.

Middle managers are found throughout the province. There is a slightly higher than average concentration in the Lower Mainland (62%), and a slightly lower than average share in Northern B.C. and the Okanagan-Kootenay regions. There is some variation in geographic location based on occupational group. Financial, engineering, information systems and purchasing managers, for example, are much more likely to be located in the Lower Mainland. On the other hand, a greater than average share of utilities managers and managers in primary resource production are in the Northern B.C. and Okanagan-Kootenay regions.

Women are somewhat underrepresented in middle management. They represent 38% of all middle managers, compared to 46% for the overall B.C. workforce. Among specific middle management occupations there is a wide variation in women's participation. For example, women have a much higher than average representation in health care (71%), social, community and correction services (68%), and in libraries, archives, museums and art galleries (69%). Their lowest representation is in primary resource manufacturing (8%), construction and transportation (7%) and utilities management (12%).

The average age of middle managers is higher than the workforce average, although not as high as that of senior managers. The difference is most noticeable among workers under the age of 34 years. For the workforce as a whole the under 35 group represent 40% of all workers, while they represent only 29% of the middle management occupational group. Middle managers as a group average 41 years of age, compared to the average of 38 for the total workforce in B.C.

Employment Prospects

This is a very large occupational group, made up of about 170,370 workers and accounting for over 9% of all workers in 1998 in B.C. The Canadian Occupational Projection System (COPS) projects employment in this group to grow at an annual rate of 2.3%, faster than the average for all occupations. According to this projection, a total of 81,630 positions will become available between 1998 and 2008. A little over half of these openings will result from growth in the number of new positions. The remainder will come from the need to replace workers who retire. Most of these replacement openings will occur during the latter half of the projection period because of the ages of these workers.

Middle management positions have historically been confined to large organizations. In recent years, however, the traditional, large firm, hierarchical middle management function has been disappearing. At the same time, the number of managers and operators of small businesses has been increasing rapidly in many industrial sectors. These trends are expected to continue through to the year 2008.

This occupational group includes management positions for many different industries. Employment growth projections vary considerably between occupations in this group. These variations will depend mainly on the prospects for economic growth in each industrial sector, but will also depend on each industry's business structure and on the impact technology has on middle management functions in large organizations.

About 25% of all managers in this occupational group are *retail trade managers*, and about 25% (19,840 in total) of the projected openings are for these positions. These managers make up the largest occupation in this group. Employment in this occupation is projected to grow faster than the average for all occupations. Much of the growth in these management positions comes from growth in the number of small businesses and also in the retail trade industry.

Restaurant and *food services managers* make up the next largest occupation in this group. Employment in this occupation is projected to grow much faster than the average for all occupations and to account for about 13% (10,640 in total) of the total projected openings for this occupational group. Rapid growth in tourism and the accommodation and food services industry is responsible for this high employment growth rate.

Information systems and *data processing managers* make up the only other occupation in this group with a higher employment growth projection than restaurant and food services managers. Growth in information systems and data processing is the result of the growing use of information systems and related technologies across industries. Because of its relatively small size, however, only about 4% (3,450 in total) of the projected openings are for positions in this field.

In general, *managers* in *sales* and *services* fields are expected to have faster growth as tourism and personal services expand. A large part of the growth in the number of managers is due to the increasing number of small businesses opening up in these industries. Financial and administrative managers, who are found across all industries, will see some increases in employment openings as a result of economic growth. However, technology is expected to work to reduce and change these specialist middle management functions, which are usually found in large organizations. Employment growth is expected to be the lowest among middle managers employed in government, or government funded services, reflecting government policies to constrain expenditures.

Middle managers in *financial* and *business* areas are expected to have about average growth. These middle management fields, as well as those in manufacturing and resource industries, have been experiencing downsizing during the past decade. Future opportunities for these areas will emphasize professional knowledge and skills and will be less tied to a hierarchical view of management.

Despite the faster than average employment growth projected for this group overall, competition for positions in all of these fields will remain high. Competition will be particularly high in industries such as government, where little growth is expected.

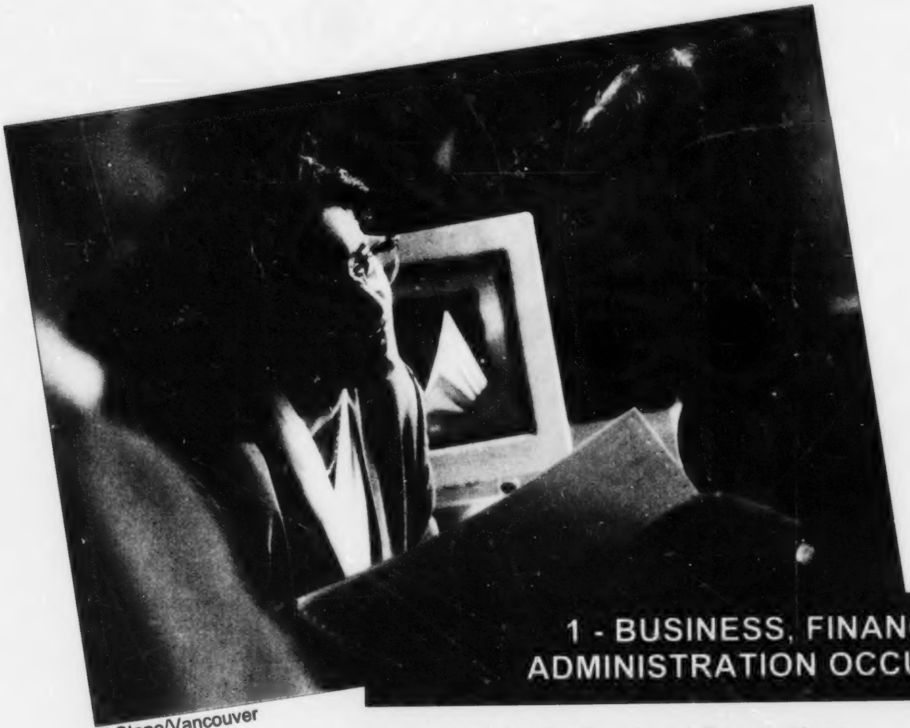
These are not entry-level jobs, and those who are interested in management positions should first look at completing post secondary education appropriate to the occupation and industry of interest. This is generally followed by work in a related profession, trade or other occupation for a number of years to build up work experience. In addition, obtaining related supervisory experience is helpful in moving into management positions.

Additional Information

For more information on computer-related occupations, see the *Information Technology Occupations* section in the *Introduction to Work Futures*.

Related Occupations

- building manager (in 1224 property administrators)
- construction foreman/women (in 721 contractors and supervisors, trades)
- contractors, trades (in 721 contractors and supervisors, trades)
- court manager (in 1227 court officers and justices)
- database manager (in 2162 computer systems analysts)
- farmers and farm managers, (in 825 contractors, operators, and supervisors in agriculture, aquaculture and horticulture)
- greenhouse manager (in 825 contractors, operators, and supervisors in agriculture, aquaculture and horticulture)
- hotel clerk supervisors (in 621 sales and service supervisors)
- housekeeping managers (in 621 sales and service supervisors)
- independent trucker (in supervisors, railway transport operations 722)
- sales and service supervisors (621)
- senior managers (00)
- supervisors, mining, oil and gas (822)
- supervisors, railway and motor transport (722)



© Stone/Vancouver

1 - BUSINESS, FINANCE AND ADMINISTRATION OCCUPATIONS

Skill Level A - Professional Occupations

1111 Financial Auditors and Accountants 46
1112 Financial and Investment Analysts 49
1113 Securities Agents, Investment Dealers and Traders 51
1114 Other Financial Officers 54
1121 Specialists in Human Resources 56
1122 Professional Occupations in Business Services to Management 59

Skill Level B - Technical, Paraprofessional and Skilled Occupations

1221 Administrative Officers 62
1222 Executive Assistants 64
1223 Personnel and Recruitment Officers 66
1224 Property Administrators 69
1225 Purchasing Agents and Officers 71
1226 Conference and Event Planners 74
1227 Court Officers and Justices of the Peace 76
1228 Immigration, Employment Insurance and Revenue Officers 78
1231 Bookkeepers 81
1232 Loan Officers 83
1233 Insurance Adjusters and Claims Examiners 85
1234 Insurance Underwriters 87
1235 Assessors, Valuators and Appraisers 90
1236 Customs, Ship and Other Brokers 92
124 Secretaries, Recorders and Transcriptionists 94

Skill Level C - Intermediate Occupations

141 Clerical Occupations, General Office Skills 99
142 Office Equipment Operators 102
143 Finance and Insurance Clerks 104
144 Administrative Support Clerks 108
145 Library, Correspondence and Related Information Clerks 110
146 Mail and Message Distribution Occupations 112
147 Recording, Scheduling and Distributing Occupations 115

Financial Auditors and Accountants

NOC 1111

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	12,350	16,680	21,350

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
4,670	3,190	7,860

Annual Growth 1998-2008

2.5%

Main Industries of Employment

Professional Business Services	43%
Finance, Insurance, and Real Estate	7%
Federal Administration	6%

Employment by Region

Lower Mainland	70%
Vancouver Island	13%
Northern B.C.	6%
Okanagan Kootenay	12%

Self-employment

28%

Nature of the Work

All businesses and individuals keep records of financial transactions. Auditors and accountants organize and analyse these records according to recognized accounting procedures. This is a very large occupational group.

Financial auditors analyse accounting and financial records to ensure that they are accurate and comply with accounting procedures and relevant legislation. Accountants manage accounting systems that organize financial information to meet the needs of a business, organization or individual.

There are three professional accounting designations, chartered accountant (CA), certified general accountant (CGA) and certified management accountant (CMA).

These professionals are employed throughout the private and public sectors by large and small companies as well as auditing and accounting firms, or they are self-employed.

Main Duties

These professionals work with financial data. The auditors are responsible for reporting on others' work, while the accountants are responsible for preparing financial statements.

Auditors analyse financial records for accuracy to make sure they meet with established standards. They conduct field audits to make sure records comply with legislation such as the Income Tax Act and the Canadian Business Corporations Act. They also prepare reports and recommend improvements to accounting and management practices.

Accountants set up and maintain accounting systems and prepare financial statements and reports for individuals, departments and organizations. They develop internal control procedures for organizations and businesses and prepare income tax returns. They also analyse financial statements to provide financial, business and tax advice, and they act as trustee in cases of bankruptcy.

Example Titles

- accountant
- certified general accountant (CGA)
- certified management accountant (CMA)
- chartered accountant (CA)
- financial auditor
- internal auditor

Education and Training

Becoming an accountant involves a combination of formal study and practical experience. Students can earn a designation as a Certified General Accountant (CGA), Certified Management Accountant (CMA) or Certified Accountant (CA). Auditors usually train as CGAs, CMAs or CAs and have several years' experience as accountants.

The Certified General Accountant (CGA) program is open to students with a variety of educational backgrounds. The CGA Program consists of 17 academic courses, all of which may be taken directly through the Certified General Accountants Association of B.C. The program can be completed in five to six years on a part-time basis. Access to a computer is required after the first level of the program. Prior to certification CGA students must complete the CGA Program and a recognized bachelor's degree. In addition, CGA students must attain a minimum of two years of acceptable practical experience. Many colleges, university colleges and universities offer courses that are equivalent to those required in the first levels of the CGA program, and students can receive transfer credits for those courses successfully completed prior to admission to the CGA program.

The Certified Management Accountant (CMA) designation requires successful completion of a two-year, part-time Strategic Leadership Program and two years of full-time work experience. The Strategic Leadership Program focuses on using financial and other information to facilitate better organizational planning, development and decision making. It consists of a series of modules, weekend workshops and management reports. Admission to the Strategic Leadership Program requires passing the National Entrance Examination. To be eligible to write the entrance exam, 15 courses (or their equivalent), available through the CMA Society's Associate Accounting Technologist and Entrance Examination Programs, or through most colleges, university colleges and universities throughout the province, must be completed. Students with a recognized undergraduate degree or post secondary diploma may be eligible for advanced standing.

Becoming a Chartered Accountant (CA) requires completion of a School of Chartered Accountancy (SCA) program, offered by the Institute of Chartered Accountants of B.C., as well as 30 months of work experience with an approved CA firm, successful completion of a national Uniform Final Examination (UFE) and 35 hours of professional development. Admission to this program can be met in a number of ways.

University graduates with no background in accounting can complete prerequisite courses through the Diploma in Accounting Program (DAP) offered at the University of British Columbia (UBC). The majority of DAP courses are offered during the spring/summer term. All prerequisite courses are also available through the CA admission route offered at Camosun College. Prerequisite courses can also be taken through BCIT, the Open College/Open University, and many universities, university colleges and colleges. Mature students (people with five or more years of relevant work experience and/or education) can write the Graduate Management Admissions Test (GMAT) and complete prerequisite accounting courses to enter the School of Chartered Accountancy.

Many graduates of business/commerce degree programs with a concentration in accounting already have prerequisite courses for one of the above designations. Undergraduate programs in business administration and commerce are available at all public universities in B.C. Various concentrations or options are available within these programs, including accounting, finance, international business, marketing, policy analysis and human resource management. Simon Fraser University (SFU) offers a cooperative education route, which allows students to work on their bachelor's degree in business administration and CA designations simultaneously. A master's degree in business administration is available at SFU, UBC and the University of Victoria.

BCIT, Kwantlen University College, University College of the Cariboo, Okanagan University College and University College of the Fraser Valley also offer bachelor's degrees in business administration. The Open University offers a bachelor's degree in administrative studies with options in business management and public sector management. Admission to these undergraduate programs requires graduation from secondary school, with a strong background in mathematics, business and English.

Business certificate and diploma programs are also available at all B.C. public colleges and university colleges. These programs prepare graduates for entry-level positions in both public and private enterprises. Admission requirements generally include grade 12, with a strong background in mathematics and English.

For students who have not completed grade 12, many B.C. colleges and university colleges offer upgrading programs.

Skills in advanced mathematics are not necessary to become an accountant, although an interest in and an ability to work with facts and figures is essential. Strong analytical skills and computer literacy are essential. Precision, attention to detail and high ethical standards are fundamental requirements in this line of work. These people must be good at strategic planning and decision making. They must be comfortable working independently as well as with a team. Supervisory and management skills are often important. Accountancy is a people-oriented profession, and accountants need to be diplomatic, helpful, friendly, good-humoured and able to speak and write fluently. A willingness to continue learning through practical training and specialized courses is important.

Working Conditions

Accountants generally enjoy good working conditions in offices. They must have an aptitude for numbers and finance to do the careful, detailed work required with statistics and tables.

Large firms hire accountants directly to analyse their financial data. Accounting firms offer services to small businesses to assist in the management of their financial records and financial planning. Currently, more accountants work for companies in a variety of industries than work in smaller accounting firms, although they can move freely between the two. This gives workers a wide variety of career options.

Accountants must be computer literate to be able to understand and manage financial data. Small companies maintain financial records on personal computers, while larger ones use more sophisticated management information systems. The average accountant can use a dozen or more computer programs regularly.

With average earnings of $40,000 in 1995, this occupational group earned well above the provincial average earnings for the workforce. Those who worked full time, full year earned $47,300.

There is a significant difference in the average earnings of women ($31,500) and men ($47,900) in this group. Women tend to be younger and engaged in more part-time work than their male counterparts, which may partly account for some of this difference in earnings.

As new entrants to these professions, recent college graduates reported an average starting salary of $2,340 per month ($28,100 per year).

This is a very large occupational group. In 1990 there were about 12,350 workers in B.C. By 1998 the group had grown by an estimated 4,330 people to 16,680.

These professionals offer a recognized business service that can be contracted out easily. Consequently, slightly more than one-quarter of these workers are self-employed. With 28% in the self-employed category, this is almost double the provincial average.

Financial auditors and accountants also tend to be full-time workers. Only 13% work part time. In total, 87% of these professionals work full time, but only 68% work full time for the whole year. More women are part-time workers. Three-quarters of the men work full time, full year, while slightly less than two-thirds of the women do.

The unemployment rate for this group is lower than the average for all occupations. Although their work is required year round, they may be especially busy prior to the deadline for filing income tax returns and during the preparation of year end financial statements.

These workers are found in all industries, but a little less than half of them (43%) provide professional business services. The finance, insurance and real estate industry employs 7% of these professionals.

This is mainly an urban occupation. The Lower Mainland accounts for 70% of the workers, and another 8% live in Victoria. All other regions are underrepresented.

The number of women in this field increased by 55% from 1991 to 1996 and now constitutes about 48%, which is close to the proportion of women (46%) in the entire B.C. workforce. The women in this occupation are younger than the men. The average age for women is 39, while it is 43 for men.

There are very few workers in the under 25 age group. This reflects the amount of training required to enter the profession.

Employment Prospects

Analysts project that this occupational group will grow at an annual rate of 2.5%, much faster than the overall average growth of 1.6% forecast for all occupations. Employment prospects are good due to the rising demand for business services being developed to serve a growing and more diverse population. This increased growth is partly driven by the pressure to meet international competition, which is forcing many businesses to develop more cost data in order to increase their efficiency. Increasing international trade also adds to the need for complex financial knowledge, further increasing the employment prospects for this occupational group. The anticipated strong employment growth in accounting will tend to emphasize higher level functions such as advice and audit. Employment prospects in this occupational group are not much affected by short-term changes in economic conditions, as many accounting functions, such as preparing tax returns and financial reports, must be done in any event.

A total of 4,670 new opportunities are projected to become available for *financial auditors* and *accountants* from 1998 to 2008. An additional 3,190 openings will result from the replacement of retired workers. Competition for these openings will be strong because of the number of qualified post secondary graduates looking for training positions in this field. Additional competition will come from those moving to the province from other provinces or countries who possess the relevant qualifications.

Accountants are either self-employed or employed in accounting firms or other large companies. Opinions differ within the financial profession as to the relative size of these proportions. Some believe that a growing proportion of accountants work in accounting departments of firms in various industries. These sources indicate that a growing number of companies are finding it more cost effective to conduct audits internally rather than contracting the services of an independent accounting firm. Other sources believe that a growing proportion of accountants are self-employed. This field already has an unusually high proportion of self-employed workers, 28% compared to just 15% across all occupations. Many of the new opportunities will be for those who can operate their own individual or small accounting practice.

The type of work that accountants do is changing. Popular accounting software allows the routine accounting tasks to be done by lesser trained assistants. The speed with which financial data can be gathered and analysed is increasing rapidly with electronic data interchanges. Accountants must develop the knowledge and tools to keep pace with these information technology improvements. Yet sources in the profession say that the spread of computers in the past has increased employment opportunities for accountants and will continue to do so. Not only does the computer allow accountants to do their work more efficiently, it also gives them more tools to analyse business activities and to assist in investment decisions, increasing their value in business organizations and on management teams. This trend is expected to continue.

It is possible for *accountants* and *auditors* to advance to internal or external auditing or accounting management positions with experience. These professionals often progress to general and senior management responsibilities as well.

Additional Information

Canadian Institute of Chartered Accountants
http://www.cica.ca/cica/cicawebsite.nsf/public/homepage

Certified General Accountants Association of B.C.
http://www.cga-bc.org/

Certified Management Accountants of B.C.
http://www.cmabc.com

Related Occupations

- bookkeepers (1231)
- program or other non-financial auditor (in 416 policy and program officers, researchers and consultants)
- financial managers (in 01/09 middle and other managers)

The type of work that accountants do is changing. They must develop the knowledge and tools to keep pace with information technology improvements.

Financial and Investment Analysts

NOC 1112

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	1,140	1,880	2,440

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
560	370	930

Annual Growth 1998-2008	2.6%

Main Industries of Employment

Finance, Insurance, and Real Estate	48%
Other Business Services	12%
Provincial and Territorial Administration	9%

Employment by Region

Lower Mainland	75%
Vancouver Island	20%
Northern B.C.	0%
Okanagan/Kootenay	4%

Self-employment	22%

Nature of the Work

Because businesses require capital to run, they use a variety of financial instruments to attract investors. Both the businesses themselves and their investors need some understanding of financial markets to assess the risks and possible returns for each of these instruments.

Financial and *investment analysts* assess financial information to provide financial and investment advice. They are employed by many varieties of companies, such as banks, brokerage houses, insurance companies, investment houses, manufacturing firms, trust companies, utilities and underwriting firms. A growing number are self-employed. This remains a very small occupational group.

Main Duties

In these occupations, analysts collect financial and investment information about companies, stocks, bonds and other investments. They analyse the information collected to advise clients, senior company officials, pension fund managers, securities agents and associates. In addition, they prepare company, industry and economic outlooks, analytical reports and briefing notes.

These workers are good with numbers and have analytical minds. They undertake a lot of careful research to understand changes within an industry. They use their computer skills to analyse the data they collect.

Example Titles

- chartered financial analyst
- financial analyst
- financial consultant
- investment analyst
- money market analyst
- securities analyst
- mutual fund representative
- investment representative
- investment advisor
- options specialist
- registered futures representative
- financial management advisor/advanced financial planner
- portfolio manager

©Stone/Vancouver

Education and Training

A bachelor's degree in commerce, business administration or finance is usually a prerequisite to entering this field. Graduate work in economics or business is also considered good preparation. Some management level experience in industry, often in the area being analysed, is an asset. In technically complex industries, such as oil, gas and mining, financial analysts also need relevant special training, such as a degree in geology or mining engineering. In some settings analysts may be required to have a professional accounting designation or a master's degree in business administration.

Investment analysts and *foreign exchange traders* must complete a Canadian Securities Course and the Conduct and Practices Handbook Course offered by the Canadian Securities Institute (CSI) to receive a licence to sell securities. CSI also offers more advanced courses in investment finance. As well, completion of the Chartered Financial Analyst self-study program, offered through the Association for Investment Management and Research in the United States, is becoming a new industry standard for analysts.

Undergraduate programs in business administration and commerce are available at public universities in B.C. Various concentrations or options are available within these programs, including accounting, finance, international business, marketing, management information systems, policy analysis and human resource management. Master's degrees in business administration are available at Simon Fraser University, the University of British Columbia (UBC), the University of Victoria and Royal Roads University.

UBC's Portfolio Management Foundation (PMF) offers extracurricular work experience for a select group of students in third and fourth year commerce and business programs. Students manage a large portfolio and, in so doing, work closely with professionals in the financial industry to develop research and analysis skills. Students receive two summers of internship employment. Typically many students spend a summer in Toronto with a large brokerage firm and a summer in Vancouver with a money management firm. Admission to PMF is competitive but not limited to UBC students.

The British Columbia Institute of Technology, Okanagan University College, Kwantlen University College, University College of the Cariboo and University College of the Fraser Valley also offer bachelor's degrees in business administration. The Open University offers a Bachelor of Administrative Studies, with options in business management and public sector management.

Admission to undergraduate programs requires graduation from secondary school, with a strong background in mathematics, business and English. Many colleges provide upgrading programs for those who have not completed grade 12. Admission to graduate programs usually requires a relevant undergraduate program.

Financial/investment analysts must have excellent numerical and analytical skills to conduct thorough, objective research and make recommendations for investment decisions. They must be able to form independent judgements that are not swayed by the weight of mass opinion, and they must have high ethical standards. Self-starters with strong initiative will succeed. Good communication skills, both oral and written, are needed for writing detailed reports and communicating with clients and co-workers. Computer skills are absolutely essential. A willingness to upgrade skills and knowledge regularly is a key to success.

For a review of related occupations, see the profile Financial Auditors and Accountants (1111).

Working Conditions

These professionals work mainly in offices that have computer equipment linked to electronic data sources on companies, stocks, bonds, money markets and other investment information. Traditionally, this work has been in larger firms, but advances in personal computers and data transfer have made it more feasible for these professionals to work in small offices.

These analysts work closely with managers in the industry they are analysing, to discuss trends and gather information. There is pressure on the analysts to provide accurate information, because it forms the basis of financial decisions, and executives track the results of these decisions.

Salary figures for 1995 indicate that the average earnings for workers in this occupational group were $72,000, which is two and one-half times the provincial average for all workers. For those who worked full time, full year, the average earnings were $72,200. In a recent survey it was found that the average annual salary for new college graduates entering this field was $34,700. It takes time and training to develop the skills necessary to gain one of the better paying positions.

This is a small and specialized occupational group offering services to businesses. In 1990 there were about 1,140 people in the occupation. By 1998 that number had increased to 1,880 people.

About 22% of the workers are self-employed, which is greater than the average for all occupations. With advances in computer technology these workers can now access the data they need through electronic means.

A higher proportion of these workers work full time than is the case for the overall workforce. Those who work full time represent 85% of the financial and investment analysts, while just 15% work part time. About 70% of the workers are employed full time, full year.

The unemployment rate in this field is lower than the average for all occupations. There is little seasonal variation in the workload because the demand for services is fairly constant throughout the year. Work is constant even during economic slowdowns.

Over 45% of these professionals are employed in the finance, insurance and real estate industry, 12% work in other business services (for example, management consulting), and another 9% are employed by the provincial government. Many others are distributed throughout the financial departments of large companies.

This is an urban occupation. Over 90% of the workers live in the Lower Mainland and Victoria. Three-quarters of the workers live in the Lower Mainland.

Women are somewhat underrepresented in this group. Women represent 46% of all workers in the province, but only 39% of financial and investment analysts.

In this occupation, 68% of the employed workers are in the 25 to 44 age range, compared to 53% for all employed workers in B.C. Most of the women workers (48%) are between 35 and 44 years of age, compared to only 34% of the men. There is an almost total lack of workers under 25 because of the training and experience required to do the work. The average age is 40, and overall the men in this group tend to be slightly older than the women.

Employment Prospects

Employment in this occupational group is projected to grow at an average annual rate of 2.6%, much faster than the average for all occupations. According to this projection, 930 positions will become available from 1998 to 2008. Most of these openings will result from growth in the number of new jobs, and the remainder will result from the replacement of retired workers. Some factors that contribute to the employment prospects include the entrance of non-banking institutions into the financial industry and the rapid growth of mutual funds throughout the 1990s. In addition, the growth of international trade and the freer movement of money across international borders increase the need for analysts, particularly those with knowledge of foreign financial markets.

Mergers and acquisitions within the financial services sector, which led to the elimination of the old trust companies, may tend to dampen growth in demand for *financial* and *investment analysts*. However, the credit union sector has been strong and gaining market share for years in B.C. and is beginning to move into the investment fund management field. Along with corporate and trade connections to the Asian economies, the growth in alternative financial service firms can provide new opportunities for this occupational group.

Good computer skills are now a necessity for these professionals. The revolution in computers has enabled these professionals to do their work far more efficiently and effectively than in the past. In addition, access to the Internet has improved their ability to attract clients. These factors have contributed to the employment growth in this field. Industry sources expect this trend to continue throughout the next ten years.

Although employment in this occupational group is projected to grow much faster than average, it is still a small group in B.C. because big Canadian banks undertake financial and investment analysis at their headquarters in Toronto. Few investment funds are managed from this province. In B.C. these professionals are heavily centred in the Lower Mainland, where three-quarters of all financial and investment analysts reside. The large number of graduates who are trying to enter these professions will intensify the competition for the available openings.

Financial and *investment analysts* can advance to supervisory positions with experience. The most experienced workers often advance to management. They can also transfer their skills to a number of businesses that require financial advice or financial planning information.

Additional Information

Association for Investment Management and Research
http://www.aimr.com

Canadian Securities Institute http://www.csi.ca

Portfolio Management Foundation
http://www.commerce.ubc.ca/PMF/home.html

Related Occupations

- securities agents, investment dealers and traders (1113)
- financial planners (in 1114 other financial officers)

Securities Agents, Investment Dealers and Traders

NOC 1113

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	2,440	4,090	5,220

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
1,130	800	1,930

Annual Growth 1998-2008	2.5%
Main Industries of Employment	
Finance, Insurance, and Real Estate	91%
Other Business Services	8%
Services Incidental to Mining	1%
Employment by Region	
Lower Mainland	82%
Vancouver Island	9%
Northern B.C.	1%
Okanagan/Kootenay	8%
Self-employment	25%

Nature of the Work

Corporations and government raise capital by issuing a variety of investment instruments with varying degrees of risk to the public. There are many specialists who help investors buy these instruments from corporations and governments.

Securities agents and *investment advisors* (investment dealers) buy and sell stocks, bonds and other securities for clients. Traders (investment representatives) buy and sell these securities at stock exchanges on behalf of investment advisors.

The buying and selling of securities involves the transaction of legal documents setting out the obligations and risks of investments. These specialists understand the terms of each document. They are employed by investment companies, stock brokerage firms, and stock and commodity exchanges.

Main Duties

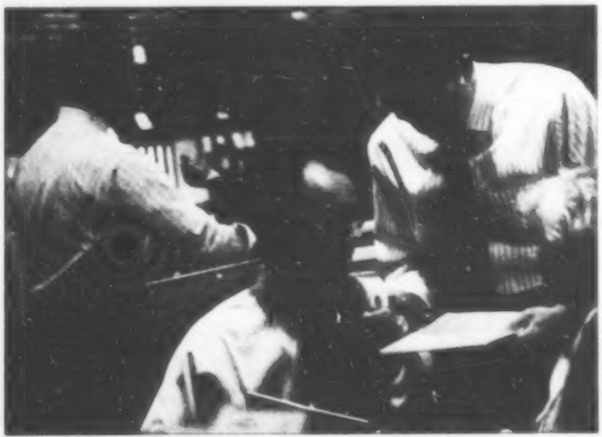
These professionals work together to buy and sell securities. Securities agents and investment advisors (investment dealers) work directly with investors, while the investment representatives (traders) represent investment advisors on the stock exchanges.

Securities agents and *investment advisors* buy and sell securities for individual investors, pension fund managers or companies. They provide investment information and advice to clients and review financial reports to identify potential investments for clients. They also monitor clients' investment portfolios and ensure that investment transactions are carried out according to industry regulations.

Investment representatives buy and sell stocks, bonds, commodity futures, foreign currencies and other securities at stock exchanges on behalf of the investment advisors. They develop trading strategies by reviewing investment information and market conditions from the exchange floor and by keeping in touch with other investment firms, pension fund managers and financial analysts. They also complete the details of sales on exchange trade tickets.

Example Titles

- bond dealer
- commodities investment representative
- floor investment representative, commodity exchange
- investment advisor
- mutual fund salesperson
- securities sales agent
- stock broker
- supervisor, investment advisors
- equity trader
- cage manager



© Stone/Vancouver

Education and Training

High school graduation is required, and a bachelor's degree in business administration, commerce or economics is strongly recommended to enter this field. Undergraduate programs in business administration, commerce and economics are available at public universities in B.C., many offering a co-op program option. Most university colleges and the British Columbia Institute of Technology offer a bachelor's degree in business administration. The Open University offers a Bachelor of Business Administration with options in business management or public sector management. As well, most colleges and university colleges offer university transfer courses in business. Admission to these undergraduate programs requires graduation from secondary school, with a strong background in mathematics, business and English. Master's degrees in business administration are also available through most universities.

To be an *investment advisor* one must be licensed with the B.C. Securities Commission, which involves a combination of education and training requirements. Applicants must first pass the Canadian Securities Course and the Conduct and Practices Handbook Course examinations offered by the Canadian Securities Institute (CSI) to become eligible for a licence. An applicant becomes licensed once he or she is employed by a firm in the investment industry. The individual must complete a 90-day training program with the employer. To remain registered the individual has 30 months from the day of becoming licensed to complete the Professional Financial Planning Course or Investment Management Techniques Course (also offered by CSI). Specialized courses from CSI are also available for those who want to become licensed to deal in specific investment products, such as securities options and futures contracts.

A specialty profession in the securities industry is that of an investment representative. CSI offers a Traders Training course, which is a requirement for professionals seeking registration to trade on the Canadian Stock Exchange. This profession requires an ability to understand the market's psychology, see through the maze of immediate market activities, put trends into perspective and anticipate the long-term direction of the market.

High energy, an ability to work in a competitive environment, a strong desire to succeed and sales ability are vital in these occupations. Self-confidence and an ability to handle rejection are also important. A good memory, an aptitude for mathematics, analytical skills and an ability to adapt to changing market conditions are also important. Knowledge of computers, especially systems used for the stock market, is essential. Knowledge of various cultures, customs and languages is a strong asset. A willingness to upgrade knowledge and skills regularly is a key to success.

Working Conditions

While both investment dealers and investment representatives require a sound knowledge and understanding of financial markets, they require very different aptitudes. *Investment dealers* work directly with clients to assess their problems and needs. They require good communication skills and problem solving ability to win the trust of clients. Even those associated with major investment firms work independently and need an entrepreneurial spirit to succeed.

Investment representatives (traders) use computer systems to trade stocks on the major stock exchanges. It is a very exciting but stressful and competitive work atmosphere. Many burn out before they reach levels where they earn high incomes. An investment representative needs excellent strategic skills, a good memory and foresight about the markets.

The average earnings for this group in 1995 were $59,400, which was more than twice the provincial average earnings for all occupations. Those who worked full time, full year earned $69,000. According to a survey of recent college graduates, the average starting salary for those entering the profession was about $31,100 per year.

This is a medium-sized occupational group. In 1990 there were about 2,440 workers. By 1998 the numbers had grown to about 4,090 workers.

Because individuals can service clients from small offices, about 25% of these workers are self-employed, which is well above the average for all occupations in B.C. There is a less than average opportunity for part-time work, with only 14% of the workers in that category. Over 65% of the workers in this profession work full time, full year, and 86% work full time for at least part of the year.

The unemployment rate for this group is lower than the average for all occupations. There is no seasonal pattern to these occupations as stock exchanges are open year round. However, the demand for workers in this field can vary with the fortunes of the stock market.

These specialists work predominantly in the finance, insurance and real estate industry, which employs 91% of them. Business services, for example, management consulting services, is the other industry that provides employment.

About 83% of these workers live in the Lower Mainland because of its financial dominance in B.C. It is home to the Vancouver Stock Exchange and many corporate head offices. Another 6% of these workers live in Victoria. The remaining 11% are distributed throughout the province.

Women constitute 31% of the workers in this occupational group, but a growing number are entering the field. Average salaries for women in this group have not yet matched their male colleagues. Women who worked full time, full year in 1995 earned $42,800 on average, whereas men earned $80,800 on average. The women in these jobs were on average younger than their male colleagues and consequently in more junior positions, which partly explains the difference in earnings. The average age for women workers is 37, compared to 41 for men. Men are most numerous in the 25 to 34 year old age group. In addition, 74% of the women in this age category are aged 25 to 44, while only 55% of the men are in this age category. As these women move through the ranks into more senior positions, their average salaries should improve.

Employment Prospects

This is a medium-sized occupational group, made up of about 4,090 workers in B.C. in 1998. Projections from the Canadian Occupational Projection System (COPS) call for an employment growth rate of 2.5%, much faster than the average for all occupations. According to this projection, 1,130 positions will become available from 1998 to 2008. Most of these openings will result from growth in the number of new jobs, and the remainder will result from the replacement of retired workers. Due to the highly competitive nature of securities sales work, some additional employment opportunities will become available to replace beginners who leave this occupation because they are unable to establish a sufficient clientele. The anticipated high growth in employment of these professionals is partially attributed to a growing public interest in investment options other than savings deposits. The aging of the population is causing a growing number of individuals to invest for their retirement years.

Strong competition is expected for these employment openings because of the number of post secondary graduates and other qualified individuals looking for training positions in this field. Additional competition will come from those moving to the province who bring appropriate experience with them. The number of openings available fluctuates with the level of economic activity. During periods of sluggish economic activity, the number of persons seeking jobs usually exceeds the number of openings, sometimes by a great deal. Even during periods of rapid economic expansion, competition for securities sales training positions is keen, particularly in larger firms, due to potentially high earnings.

There are other changes taking place that are likely to affect the skills required for this work. The finance industry is restructuring, and institutions such as banks are now involved in selling securities. Good computer skills are now essential for these professionals because most transactions are now done electronically, and most of the necessary information is also available electronically. Internet investment services now enable trading to be done through any broker who is linked to the Internet, not just local brokers. Some Internet services now allow clients to make transactions without the use of a broker at all and at an interest-based discount. These are relatively new developments, whose impacts on financial industry employment are still unclear, but which will be important factors over the next ten years.

Supervisory or managerial positions in this occupational group are limited and can only be found in larger investment firms and banks. However, these professionals can transfer their skills and experience to other positions, such as financial planner and personal financial advisor, or alternatively move into self-employment in the financial advice field.

Additional Information

British Columbia Securities Commission
http://www.bcsc.bc.ca

Canadian Securities Institute *http://www.csi.ca*

Related Occupations

- financial and investment analysts (1112)
- other financial officers (1114)
- financial brokerage managers (in 01/09 middle and other management)

Other Financial Officers

NOC 1114

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	3,580	6,100	8,510

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
2,410	1,280	3,690

Annual Growth 1998-2008	3.4%

Main Industries of Employment

Finance, Insurance, and Real Estate	57%
Other Business Services	37%
Professional Business Services	2%

Employment by Region

Lower Mainland	68%
Vancouver Island	18%
Northern B.C.	3%
Okanagan/Kootenay	11%

Self-employment	35%

Nature of the Work

There are a number of professionals who analyse business and personal finances as well as regulate the companies that take part in the financial industry. *Financial planners* and *mortgage brokers* work with individual clients to assess their personal financial needs and advise them on financial decisions. *Investment underwriters* and *trust officers* work with businesses or individuals to assist in the management of their assets. *Financial examiners* and *inspectors* and *financial investigators* work with government agencies and regulatory bodies to control the practices in the financial investment industry.

Although the services they offer vary considerably, all of these professionals must understand financial markets and the transactions that occur within them. They use this knowledge to ensure ethical and fair practices within the financial investment industry. They inform and advise clients or employers on financial decisions. They work for banks, trust companies, investment firms and government, or they may be self-employed.

Main Duties

These professionals undertake a variety of tasks. The work interests people who are good with numbers and have analytical minds. It calls for a lot of careful research to collect appropriate data. As a result, these positions also require that people have good computer skills to analyse and interpret the data collected.

Those workers who serve the clients directly use good communication skills to assess the clients' needs and to develop investment portfolios suited to those needs. They try to solve clients' financial problems and to identify financial opportunities.

©Stone/Vancouver

Financial planners analyse clients' personal financial records and objectives. They develop financial plans for them and recommend actions for managing their finances. In some cases they also arrange for sale of financial products and investments.

Mortgage brokers negotiate mortgage loans and apply for mortgages on behalf of clients. They advise clients on the financial terms and conditions of mortgage arrangements.

Financial examiners and *inspectors* review financial services and institutions to make sure they comply with governing legislation and regulations. That is, they review services, such as the selling of insurance, mutual funds or investment certificates, and institutions, such as banks, trust companies and brokerage firms.

Financial investigators investigate unethical conduct or breeches of securities laws that regulate the trading of stocks and bonds. Workers who check and enforce regulations have to be very conscientious, detail-oriented and highly principled to ensure high standards within the industry.

Investment underwriters assist corporations by determining the types of new securities required to meet their financial management objectives, underwriting the new investment issues and preparing the offering prospectus. Trust officers administer estate, personal, charitable and corporate trusts.

Workers such as these who deal with corporate financial management use good research and analytical skills to gather data on the industry as well as specific companies.

They can then compare the financial performance of similar companies to their client company's performance.

Example Titles

- estate and trust administrator
- examiner, credit unions
- financial consultant
- financial investigator
- financial planner
- inspector, financial institutions
- investment underwriter
- mortgage broker
- trust officer

Education and Training

Financial planners generally have at least a bachelor's degree in commerce or business administration or have completed an educational program designed specifically for financial planners.

Undergraduate programs in commerce and business administration are available at public universities in B.C. Various concentrations or options are available within these programs, including accounting, finance, international business, marketing, policy analysis and human resource management. As well, most university colleges and the British Columbia Institute of Technology (BCIT) offer bachelor's degrees in business administration. The Open University offers a Bachelor of Business Administration with options in business management or public sector management. Most colleges and university colleges offer university transfer courses in business. Admission to undergraduate programs requires graduation from secondary school, with a strong background in mathematics, business and English.

Master's degrees in business administration are available at Simon Fraser University, the University of British Columbia (UBC), the University of Victoria and Royal Roads University.

BCIT, Camosun College, College of New Caledonia, Malaspina University College and Okanagan University College offer diploma programs designed specifically for financial planners. In addition, the Canadian Institute for Financial Planning in Toronto offers a Certified Financial Planner Program by correspondence.

As a means of recognizing and setting standards in the financial planning profession, the Canadian Association of Financial Planners (CAFP) awards a professional designation of Registered Financial Planner (RFP). In addition to maintaining suitable professional liability insurance, RFPs are required to complete an approved educational program and pass a comprehensive examination set by CAFP. Each year RFPs are required to reapply and to confirm that all qualifications to use the designation have been met.

Financial examiners and *inspectors* may require a recognized accounting designation. For details about various accounting designations see the profile Financial Auditors and Accountants (1111).

Investment underwriters usually have a master's degree in business administration, a law degree, or a Chartered Financial Analyst (CFA) designation or other professional accounting designation. For more information on degrees in law see the profile Lawyers and Notaries (4112). For more information on a CFA designation see the profile Financial and Investment Analysts (1112). Some organizations prefer to train their own underwriting staff and on-the-job training may last for one or two years.

Trust officers generally require an accounting designation and on-the-job training.

Those who work as *mortgage brokers* require a licence. UBC, Langara College, Kwantlen College and Open University all offer various courses in real estate.

Personal characteristics required by those in this field include attentiveness to detail, good communication skills, integrity and an ability to deal with a variety of people. A willingness to consider many approaches, organizational skills and marketing skills are needed. Persistence and confidence in one's own abilities is necessary. Competition for underwriting assignments is generally very stiff, and selection is based on analytical abilities, leadership skills and eagerness to succeed. All people in this employment category require continual upgrading of skills and knowledge, including those in the area of relevant technological advances and new products and services, in order to be successful.

Working Conditions

These workers usually work in very pleasant offices that are inviting to clients. They tend to work regular hours but may occasionally extend their hours to attract business at particular times. For example, financial planners often work extra hours to sell registered retirement savings plans during January and February.

Professionals in these occupations earned an average of $47,000, with full-time, full-year workers earning an average of $52,200 in 1995. This is much higher than the provincial average of $27,900 for all workers and $39,400 for those who worked full time all year. At an average of $52,500, men in this field earned about one and one-half times as much as women.

According to a recent survey of college graduates, the average starting salary for new entrants to these professions is $2,900 per month, or about $34,800 per year. Starting salaries can be higher, especially if workers have previous related experience.

This is a large occupational group. There were about 3,580 workers in these occupations in 1990, but this number was estimated to have grown to about 6,100 workers by 1998.

Almost 35% of the workers are self-employed because communications technology permits services to be carried out independently from small offices or home offices. This rate of self-employment is more than double the average proportion for the workforce.

This occupational group involves mainly full-time work. Only 17% of the workers work part time. Overall, 83% work full time, and 63% work full time, full year.

The demand for these financial services is fairly constant and is not affected by season or business cycles. Unemployment is lower than the average for all occupations in B.C.

People working in these occupations are employed in the financial and business services industries. Financial services account for 57% of the workers, and 37% are in business services, such as management consulting services.

These are largely urban occupations. Almost 80% of the workers live in the Lower Mainland and Victoria. All of the other regions have a smaller proportion of workers than the distribution of the general workforce.

There is a lower than average participation rate for women in these occupations. Only 33% of the workers are women, compared to 46% for the workforce as a whole. In addition, very few workers in these occupations (3%) are under the age of 25. The women in this field tend to be younger than the men, which may account for some of the difference in earnings. Overall, 65% of the women are under 45, compared to 53% of the men. As the women gain experience and take on more senior positions, their salaries and representation in these occupations should improve.

Employment Prospects

Employment in this occupational group is projected to grow at an average annual rate of 3.4%, much faster than the average for all occupations. According to this projection, 3,690 positions will become available from 1998 to 2008. About 65% of these openings will result from growth in the number of new positions, and the remainder will result from the replacement of retired workers. The high anticipated growth in employment of these professionals is partially attributed to the aging of the population, which is causing a growing number of individuals to hire these professionals to help in their personal financial management in preparation for their retirement years. Businesses are also coming to rely on the assistance of financial professionals to adapt to rapidly changing business climates. These trends are expected to persist over the next ten years due to an aging population.

Financial institutions hire staff through a variety of methods, including media advertisements and recruitment agencies. The demand is strongest for workers with previous experience in this field or in a related one.

Although this is a large occupational group with a high rate of growth anticipated, entry into this field can be difficult because employers tend to hire only those with experience. Consequently, professionals in this group have often had experience in other jobs in the financial sector before entering these positions. This is particularly the case with *investment underwriters*, *financial examiners* and *financial investigators*.

Changes in government regulations have led to the provision of these specialized services by banks and other large financial institutions. These services include financial planning, estate planning, trust services and the sale of packaged financial products, such as mutual funds. The result has been that less qualified staff, or staff with on-the-job training in only specific investment products, are taking over entry-level positions for this occupational group. This makes it more difficult for professionals with formal training in investments and financial planning to get the needed experience.

In the past a high proportion of these professionals has been self-employed and consequently took late retirements. However, with larger financial institutions now providing these services, there is a greater potential for workers to progress to management positions rather than into self-employment.

Additional Information

Canadian Association of Financial Planners
http://www.cafp.org

Canadian Institute of Financial Planning
http://www.cifp.ca

Related Occupations

- personal banking officer (in 1232 loans officers)
- economic development officers and economists (in 416 policy and program officers, researchers and consultants)
- financial and investment analysts (1112)
- securities agents, investment dealers and traders (1113)

Specialists in Human Resources

NOC 1121

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	1,890	3,140	4,040

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
900	1,040	1,940

Annual Growth 1998-2008	2.6%
Main Industries of Employment	
Other Service Industries	32%
Other Business Services	12%
Finance, Insurance, and Real Estate	7%
Employment by Region	
Lower Mainland	73%
Vancouver Island	15%
Northern B.C.	3%
Okanagan/Kootenay	8%
Self-employment	8%

Nature of the Work

Many larger organizations use *human resource specialists* to administer human resources matters. These specialists develop policies and advise managers and employees on human resources matters. Periodically, smaller organizations use the services of human resources consultants.

Specialists in human resources are employed throughout the private and public sectors, or they may be self-employed. This group also includes supervisors of staff training and development. Human resources management specialists are now certified professionals.

Main Duties

These professionals help businesses and organizations manage their staff. Their work will vary by type of organization and the degree of specialization within the human resources department. Workers must understand labour laws to develop company human resources policies and to interpret and negotiate collective agreements in unionized work places. Increasingly, they are included on the management team to coordinate the staffing and recruitment implications of management decisions by analysing organizational structures and job requirements.

They prepare job descriptions, assess employee performance and maintain human resources records. They coordinate programs, such as employee assistance programs (EAPs) and workplace diversity programs. In many human resources departments some specialists assess learning needs and coordinate and lead training programs.

As well, there is a need for skills in using computer-based management information systems. More and more records are being computerized, and there is an emerging speciality in the area of information specialists.

The most important skills required for the job are communication skills. In the past much of the work of these specialists involved paperwork. For example, they would analyse job needs and administer the hiring process. With cutbacks in staff even employees who worked primarily in the background processing paper now have to deal more directly with people. Often they no longer have the front-line staff to assist them.

Example Titles

- classification officer
- conciliator
- consultant, human resources
- employee relations officer
- employment equity officer
- human resources information specialist
- human resources research officer
- labour relations officer
- mediator
- training officer

Education and Training

Specialists in human resources usually have a diploma or a bachelor's degree in psychology, sociology, business administration or human resource management, with courses in labour relations, contract law, organizational behaviour and/or human relations. Competition for entry-level positions is high, so part-time or summer experience in a human resources office is an asset.

The University of British Columbia offers an industrial relations management option within its bachelor's degree in commerce. Students must complete a first-year university program that includes specified courses before applying. Simon Fraser University (SFU) offers a human resource management concentration within its Bachelor of Business Administration degree. The University College of the Cariboo offers a Bachelor of Business Administration degree with specialization in human resources management. Admission to these undergraduate programs generally requires graduation from high school.

Most colleges, university colleges and the Open Learning Agency offer one- to two-year business administration/management programs that include human resources related courses. The British Columbia Institute of Technology (BCIT) has a two-year Human Resource Management Diploma Program. Admission to these programs also generally requires grade 12. Upgrading programs are available at most colleges throughout the province. BCIT also offers a nine-month Human Resource Management Post-diploma Program designed for people who have a related degree or diploma.

Completion of a graduate degree in human resource disciplines is becoming more common. Royal Roads University offers such programs, including a Master of Business Administration in Human Resources Management, a Master of Arts in Leadership and Training and a Master of Arts in Conflict Analysis and Management.

There are many educational opportunities offered through various continuing education divisions. These include SFU's Management Skills in Advanced Technology and Certified Employee Benefit Specialist Program. A course in mediation and conflict resolution is offered by the Justice Institute of B.C.

Because specialists in human resources are often responsible for training in the workplace, skills and programs in adult learning are also beneficial. A certificate program in adult and continuing education is offered through the University of Victoria's (UVic) Faculty of Education and Division of Continuing Studies. The program was jointly developed by UVic and the universities of Alberta, Calgary, Saskatchewan and Manitoba to help adult educators translate theory and knowledge into skilled practice.

A human resource specialist who becomes a member of the B.C. Human Resources Management Association (B.C. HRMA) or other approved human resources association, such as the Greater Victoria Human Resources Management Association, is eligible for designation as a Certified Human Resources Professional. Certification by the B.C. HRMA recognizes professional achievement, commitment to a high ethical standard and knowledge of recent developments through continuing professional development.

Specialists in human resources require excellent written and oral communication skills. They need to be able to establish rapport with people of all educational and occupational backgrounds and must be able to work cooperatively with members of a team. They should be good investigators and problem-solvers and know how to motivate people. They require conflict resolution and negotiation skills and an ability to work under high pressure. Knowledge of computer databases and processing systems is important as are skills in developing and implementing policies, programs and procedures. A willingness to undergo ongoing education in various aspects of the work and changing regulations is important. Financial management skills may be required.

Working Conditions

These professionals usually work in well-equipped offices of large organizations. In some cases they will be self-employed and working from a small or home office. They generally work regular hours, five days a week.

Human resource specialists earned an average of $52,800 in 1995. Those who worked full time, full year earned an average of $57,400, an amount much higher than the provincial average of $39,400 for all full-time, full-year workers. For men this figure was $65,700, and for women it was $49,500.

This is a medium-sized occupational group. In 1990 B.C. employed about 1,890 human resource specialists. By 1998 this number increased to 3,140 workers.

Only 8% of these workers are self-employed, and an equivalent proportion work part time. These numbers are low when compared to the workforce average of 15% for self-employment and 26% for part-time employment. Industry sources indicate that the opportunities for self-employment and contract work are increasing.

The opportunities for part-time work in this profession are less than in the labour market at large, and this situation does not seem to be changing. Almost three-quarters of these workers were employed full time, full year. The unemployment rate for this group is lower than the average for all occupations in B.C. There is no seasonal variation in employment.

Although widely distributed across all industries, the majority of people in this occupational group work in government, business and miscellaneous services, and finance, insurance and real estate.

Over 80% of these workers are in the Lower Mainland and Victoria. These people work for the larger companies and government agencies that are headquartered in these cities. Smaller companies in rural areas often do not have human resource departments, and the company managers generally take responsibility for human resource functions or contract human resource services as needed.

Women represent 52% of the human resource specialists, which is higher than the proportion of women in the B.C. workforce (46%). Their average age (41) tends to be lower than their male counterparts (48). This difference in age may account for some of the difference in the average level of earnings.

Unlike the age profile of the workforce as a whole, this occupational group has a high proportion of mature workers. Almost 70% of the human resource specialists are between the ages of 35 and 54, compared to 49% for the workforce. At just 17% of the workers, the younger age groups are significantly underrepresented. (By comparison, 40% of the B.C. workforce is aged 15 to 34.) Human resource specialists tend to be older because of the experience and education required to enter this profession.

Employment Prospects

This is a medium-sized occupational group, made up of about 3,140 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment in this group to grow at an annual rate of 2.6%, much faster than the average for all occupations. According to this projection, 1,940 positions will become available from 1998 to 2008. About half of these openings will result from the replacement of retired workers, and the remainder will result from growth in the number of new jobs. The high growth in employment anticipated for this occupational group is largely attributed to the increased volume of human resources related work due to worker turnover, retraining and other adjustments associated with a rapidly changing labour market. Developments in technology are largely responsible for these adjustments. With these labour force adjustments, the numbers and complexity of issues, tasks and ultimately jobs for this group have been increasing. This trend is expected to continue through 2008.

Competition for these employment openings is expected to remain keen because of the number of qualified post secondary graduates looking for training positions in this field. According to industry sources, at the beginning of 2000 there was a surplus of qualified workers, especially in urban areas. This is expected to persist through 2008. Additional competition will come from those moving to the province who bring appropriate experience with them.

According to industry sources, an increasing amount of work is being performed by consultants on temporary contracts of three to four months duration. Some sources estimate that as much as half of all work in this field is now contracted to consultants. This is the most cost efficient way for small and medium-sized businesses to obtain specialized human resource services. Most new jobs in this group will be in employment agencies, temporary help firms or human resource consulting firms. There will be few opportunities in the government sector.

The types of positions that are becoming available require enhanced knowledge and skills. Competency in handling legal issues around human resources is particularly important. Human resources development is becoming increasingly important because companies that are downsizing are trying to operate with fewer employees.

An area of strong growth is in the recruitment of computer and information technology workers, particularly for the high-technology industries. At the same time, information technology is directly affecting the work of ***human resource specialists***, and the Human Resources Management Association has added information management to the categories for specialization within this occupational group.

In some cases workers can enter this field as a *human resource clerk* or *officer* and then progress with experience and training. It is more likely for those who are already at a professional level in this field to enter into management positions. However, these workers are more likely to enter consulting or self employment.

Additional Information

B.C. Human Resources Management Association
http://www.bchrma.org

Related Occupations

- human resources clerks (in 144 administrative support clerks)
- personnel and recruitment officers (1223)
- professional occupations in business services to management (1122)
- training officer and instructor (in 4131 college and other vocational instructors)
- human resources managers (in 01/09 middle and other management)

Professional Occupations in Business Services to Management

NOC 1122

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	2,580	5,650	7,840

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
2,190	1,980	4,170

Annual Growth 1998-2008 3.3%

Main Industries of Employment

Other Business Services	61%
Advertising Services	9%
Finance, Insurance, and Real Estate	3%

Employment by Region

Lower Mainland	77%
Vancouver Island	13%
Northern B.C.	3%
Okanagan/Kootenay	7%

Self-employment 51%

Nature of the Work

Businesses sometimes require the services of outside professionals to improve their performance. *Management services professionals* analyse a company's or government agency's operations, managerial methods or functions and suggest improvements. *Advertising services professionals* analyse a company's advertising needs, then develop and deliver appropriate advertising plans.

These professionals are employed by management consulting firms, advertising agencies, large companies and government agencies. Many are self-employed.

Main Duties

Management services professionals solve a wide variety of business problems. Although they may have specialist expertise, they are generally required to analyse the managerial methods and organization of a firm by researching the efficiency and effectiveness of managerial policies and programs. Based on their findings, they propose improvements to operations, human resources and communications, and they plan the reorganization of the operations of a firm. To do this, they collect and analyse data to determine the extent of the problem and present their findings to their clients.

Advertising services professionals develop effective means to market products. They assess the market and the function of the client's products within that market. After assessing the needs of a target market, they advise the firm on how to reach their market through advertising or sales promotion strategies. Then they develop advertising campaigns appropriate for print or electronic media.

©Stone/Vancouver

Example Titles

- advertising account executive
- promotion specialist
- business management consultant
- business methods analyst
- consultant, organizational analysis
- management analyst
- organizational analyst

- researcher, organization and methods
- senior consultant, operations management

1

Education and Training

Management services professionals may come from many backgrounds, but the majority have a college diploma or bachelor's degree in business administration or commerce, and graduate degrees are common. Several years of broad but related experience is usually required, and managerial experience is a strong asset. Experience in non-consulting roles in the private and/or public sector can be advantageous.

Advertising services professionals usually have a college or university education with a background in business and/or marketing.

Master's degrees in business administration and undergraduate programs in business administration and commerce are available at most universities in B.C. Various concentrations or options are available within the undergraduate programs, including accounting, finance, international business, marketing, policy analysis and human resource management. Most university colleges, the British Columbia Institute of Technology and Open University offer bachelor's degrees in business administration.

Business certificate and diploma programs are also available at all B.C. public colleges and university colleges. These programs prepare graduates for entry-level positions in both public and private enterprises. Admission requirements generally include grade 12, with a strong background in mathematics and English.

These professionals need to be objective, organized, analytical and goal-oriented. They also need to be creative and visionary and able to see the overall structure. Strong management skills, such as planning, implementing, evaluating, supervising and delegating, are vital. It is also important to stay up-to-date with emerging management theories and practices. An interest in people and social organization is beneficial, as is a positive, enthusiastic approach. Computer skills are usually important and, depending upon the nature of service, may be essential.

The work is often project-based, so these professionals need to be able to work under pressure of deadlines. It is equally important to be able to work independently and as a member of a team. An ability to develop a broad client base is essential. As well, advertising professionals usually need to have high energy and be able to accept constructive criticism. They commonly have superior written and verbal skills. Self-confidence, diplomacy, keen intuition and perception, as well as an interest in a wide variety of subjects, are important in order to be successful.

Working Conditions

This occupational group will be of interest to people with creative minds who are good at problem solving. People in this group have to be able to assess a new situation quickly and develop innovative approaches to improve it. Generally, these professionals work for a variety of clients rather than in typical management positions within individual organizations. They work independently or in small teams to analyse business problems. Consequently there are many opportunities to work from small offices and on a part-time basis. They often work long hours, 50 to 90 hours per week, and divide their time between their own offices and the client's workplace.

Because of computer technology, many workers can provide these professional services from home offices. They can access and deliver the data needed for business analysis through electronic means.

These professionals often work under the pressures of tight deadlines and optimistic client expectations. Clients unrealistically may expect the professional to turn around their business in a very short time.

The average earnings in this group in 1995 of $39,800 were much higher than the all-occupation average for the province. Full-time, full-year workers earned $47,800. For men this figure was $50,700, and for women it was $42,100. According to a survey of recent college graduates, the average salary for new employees in this field was $2,840 per month, or about $34,100 per year.

This is a large occupational group, with more than 2,580 workers in 1990. The group grew by 3,070 to 5,650 workers in 1998.

Over 50% of the workers are self-employed. This is more than triple the workforce average. Part-time workers represent a lower proportion of this occupational group (21%) than for the workforce as a whole. The unemployment rate is lower than the average for all occupations. There is no seasonal component to the workload of this group.

More than half (61%) of the workers provide business services, and another 9% provide advertising services. The remaining workers provide internal services to larger companies and government agencies.

This is an urban occupation, particularly a big city occupation. In the workforce overall, 57% of all workers live in the Lower Mainland, but 77% of the workers in this occupational group live there.

In this occupational group, a third of the workers are women. However, in the younger age groups (under 34 years), 44% of the workers are women. The average age of women in this field is 40 years, while the average age of men is 46. The age profile indicates a higher proportion of workers over 45 than occurs in the workforce as a whole. This is not surprising, as related experience and advanced education are highly valued in this occupation.

Employment Prospects

Employment in this occupation is projected to grow much faster than the average for all occupations. Projections call for 4,170 openings to become available between 1998 and 2008. Roughly half of these openings (47%) are forecast to become available because of people retiring. The remaining

53% are forecast to come from growth in the number of new jobs.

The technological revolution and the trend toward globalization have forced many businesses to hire these professionals in order to help them stay competitive within the rapidly changing business climate. These factors are expected to drive the growth of this occupational group through to 2008.

This high growth can be partially attributed to the increasing reliance of large companies and governments on these professionals to provide them with analytical and advisory services that replace specialist and middle management staff.

Large management consulting firms that had reduced staff in the early 1990s are rehiring. They are hiring people with specialized experience for particular contracts or projects. Increasingly they are moving to contract arrangements with professionals with special skills, as these large management consulting firms themselves obtain consulting contracts. In these occupations, experience is more critical than specific education.

There is a growing trend for professionals who have work experience in these analytical or advice fields to move into independent consulting. Some move by choice, whereas others move because of staff cuts. Some of those affected by cuts have been rehired on contract by former employers. Employers often find it more cost effective to hire independent consultants. There is less overhead because a consultant can be contracted for work on specific tasks and removed from the payroll once the task has been completed.

The widespread adoption of computerized management systems continues to change the nature of this work. Professionals with strong computer skills have an advantage over others in seeking employment in this field.

Progression to senior management positions is possible. However, as these professionals build their reputation and client base, their relative income as independent consultants increases. Consequently, many prefer to remain independent.

Related Occupations

- economists and economic policy researchers and analysts (in 416 policy and program officers, researchers and consultants)
- financial and investment analysts (1112)
- financial auditors and accountants (1111)
- industrial and manufacturing engineers (in 214 other engineers)
- other financial officers (1114)

The technological revolution and the trend toward globalization have forced many businesses to hire these professionals in order to help them stay competitive within the rapidly changing business climate. These factors are expected to drive the growth of this occupational group through to 2008.

Administrative Officers

NOC 1221

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	12,180	16,130	21,170

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
5,040	4,900	9,940

Annual Growth 1998-2008 2.8%

Main Industries of Employment

Physicians, and Health Practitioners and Medical Labs	15%
Finance, Insurance, and Real Estate	8%
Wholesale Trade	8%

Employment by Region

Lower Mainland	61%
Vancouver Island	18%
Northern B.C.	7%
Okanagan/Kootenay	13%

Self-employment 11%

Nature of the Work

Administrative officers oversee and set up administrative procedures, set work priorities and manage the supply of administrative services, such as office space, supplies and security services. They may also handle some cash and direct the work of clerical staff. They are employed throughout the private and public sectors. This is a very large occupational group in this province.

Main Duties

The role of *administrative officer* can vary tremendously from office to office. Typical duties would include handling work assignments for staff and setting up and maintaining administrative procedures. For example, administrative officers establish work priorities, delegate work to office support staff, and ensure deadlines are met and procedures are followed. They oversee and coordinate office procedures and routines, and put new methods in place when necessary.

Administrative officers also coordinate office services, such as space assignments, relocations, parking, maintenance and security services. They manage equipment and office property by ordering and keeping inventory of supplies. They may also handle a variety of miscellaneous duties, such as administering mail and petty cash.

Administrative officers often have some financial duties, such as helping to prepare operating budgets and controlling budgets. They make sure information gets to the people who need it. They may be required to keep staff updated on changing procedures and to work with other departments or suppliers to keep services running smoothly. They also collect information and prepare periodic and special reports, manuals and correspondence. They usually use computer systems and software to get their work done.

Example Titles

- administrative officer
- administrative services coordinator
- coordinator, office services
- liaison officer
- office administrator
- office manager

Education and Training

A position as *administrative officer* usually requires a combination of education and experience. Completion of a college diploma in business or public administration is common, plus several years' experience in a senior clerical or executive secretarial position related to office administration. As competition for employment increases more people in this field have undergraduate degrees in business or commerce and several years of related experience.

Business certificate and diploma programs are available at all B.C. public colleges and university colleges. These programs prepare graduates for entry-level positions in both public and private enterprises. Admission requirements generally include grade 12. Most university colleges and the British Columbia Institute of Technology offer bachelor's degrees in business administration. The Open University also offers a Bachelor of Business Administration with options in business management or public sector management. Most colleges and university colleges have university transfer courses in business.

Undergraduate programs in business administration and commerce are available at public universities in B.C. Various concentrations or options are available within these programs, including accounting, finance, international business, marketing, policy analysis and human resource management. Admission to undergraduate programs requires graduation from secondary school.

Administrative officers need to be self-motivated and organized with an attention to detail. They need good interpersonal skills and good oral and written communication skills. Strong decision-making and problem-solving skills are also important. An ability to lead and motivate others is valuable.

Working Conditions

Workers in this occupational group tend to work in a standard office setting. Much of the work takes place in the setting of computerized information systems. Normal hours of work reflect a "9-to-5" pattern, though some after-hours or weekend work may be required depending on specific demands. This job requires keeping track of many different types of detail and being very well organized.

In 1995 the average salary for all workers in this category, including those who work part time and part year, was $33,000, which is above the workforce average of $27,900. This higher than average salary is probably due to a relatively lower proportion of part-time workers. In fact, workers in this occupational group with full-time, full-year jobs earn somewhat *less* than the provincial average for full-time work. (The average salary for administrative officers who worked full time, full year was $37,800, compared to a workforce average of $39,400.)

Recent college graduates who found work as administrative officers reported an average monthly salary of $2,220. For those who work for the full year, that will mean an annual starting salary of about $26,700. Industry reports show that experienced workers can earn above-average salaries.

This is a very large occupational group. In 1998 there were 16,130 people in this group in B.C., up from 12,180 in 1990. Self-employment among this group is possible, though somewhat less likely than average. About 11% of administrative officers report being self-employed while the average self-employment rate in the province is 15%. As well, there are few part-time workers in this occupation, with only about 16% working part time. By comparison, the part-time work rate for all workers is 26%.

The unemployment rate among administrative officers is lower than the average for all occupations. There are no general conditions that would cause this work to be seasonal, though workers employed in industries with seasonal patterns, such as construction, may be subject to seasonal decreases in the availability of work.

Administrative officers are employed across a wide range of industries. The largest employer of people from this occupational group is the physicians, health practitioners and medical labs sector, which employs 15% of these workers. More than 20 industries employ significant numbers of workers, including finance, insurance and real estate, wholesale trade, and professional business services sectors. This occupational group is present in many workplaces.

This group is slightly more urban than the average. The Lower Mainland and Victoria account for 61% and 11% respectively of those who work as administrative officers. As a comparison, the Lower Mainland and Victoria account for 57% and 9% of all workers in the B.C. workforce. About 7% of administrative officers live in Northern B.C., and 13% live in the Okanagan/Kootenay region. While these percentages are slightly lower than average for these regions, there are still over 3,500 people working in this occupation in Northern B.C. and the Okanagan/Kootenay region.

A large majority (80%) of administrative officers are women, but the men in this occupation earn a significantly higher annual salary than the women. Men who work full time, full year earn an average of $49,100 annually, while women employed full time, full year earn $34,300. Men in this occupation average 44 years of age while women average 41.

Compared to other occupations, administrative officers are slightly older. This work usually requires related experience, so most people will start in more junior positions. Most workers (63%) are between 35 and 54 years old (compared to 49% for the workforce overall). The average age for all workers in this occupational group is 42.

Employment Prospects

This is a very large occupational group, made up of 16,130 workers in B.C. in 1998. Projections from the Canadian Occupation Projection System (COPS) call for a growth rate of 2.8%, much faster than the average for all occupations. This projection implies that between 1998 and 2008 a total of 9,940 openings will become available. About half of these openings are forecast to become available because of people retiring, with the remainder to come from growth in the number of new jobs.

These professionals represent a growing proportion of total clerical and administrative support positions, and this occurs as computers continue to reduce the need for clerical staff to perform more routine tasks. With the growth in new technologies, *administrative officers* are able to perform and manage a wider range of tasks, and there is growing justification for hiring these workers. The fast growing small business sector increasingly requires the services of this occupational group. This occupation is usually not subject to major swings related to business cycles but is affected more by changes in organizations and technology.

New technologies may improve the productivity of this occupational group and thus reduce the actual employment growth from the high rate that COPS projects. Due to the large size of this group, even an average growth rate would provide a significant number of job openings.

Downsizing across industries makes it more difficult for these professionals to find jobs in larger corporations. Most openings are expected to come from the fast growing small business sector. Changes to the work brought about by automation and the increased use of computers mean that opportunities are best for workers who are comfortable using electronic tools to do their work.

Employers are raising their expectations of the qualifications for these professionals. In addition, high competition for these jobs has raised the general qualifications of potential workers in this field. As a result, most openings will be filled by those with at least a college education.

Many types of clerks may be able to work their way into administrative officer positions through experience and additional training. In some cases there is progression from work as an administrative officer to specialist and management positions for those with good education and extensive experience.

Related Occupations

- administrative clerks (in 144 administrative support clerks)
- executive assistants (1222)
- conference and event planners (1226)

- property administrators (1224)
- administrative services managers (in 01/09 middle and other management)

Executive Assistants

NOC 1222

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	1,060	1,390	1,830

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
440	430	870

Annual Growth 1998-2008 2.8%

Main Industries of Employment

Finance, Insurance, and Real Estate	11%
Provincial and Territorial Administration	10%
Other Health and Social Services	6%

Employment by Region

Lower Mainland	77%
Vancouver Island	16%
Northern B.C.	1%
Okanagan/Kootenay	4%

Self-employment 3%

Nature of the Work

Executive assistants oversee and set up administrative procedures, public relations activities, and research and analysis functions for members of legislative assemblies, ministers, deputy ministers, corporate officials, and executives, committees and boards of directors. They also often supply direct clerical and administrative support to executives. They are employed by governments, corporations and associations.

Main Duties

Workers with the title *executive assistant* may have two different types of duties. Some are senior clerical people who work for the highest ranking officers in an organization. Some are more focused on policy and analysis at a senior level and do little hands-on clerical support. Most executive assistants with mainly *administrative* responsibilities will provide direct clerical or administrative support to executives. They also set up and oversee administrative policies and procedures for the office and organization. They make arrangements for committee, board and other meetings, and manage the daily schedule of executives. They know the business well enough to manage correspondence, draft replies and handle other routine tasks associated with the executive office. In some cases they will provide support for public relations tasks, such as press releases and media inquiries.

Executive assistants with *policy* and *analysis* responsibilities will perform some duties that are similar to their administrative co-workers, though the tasks are often at a more executive level. For example, they set up and oversee administrative policies and procedures for officials, committees and boards of directors, rather than setting operating procedures for offices. They work with departmental and corporate officials, and with other organizations and associations on behalf of the executive, committees and boards of directors. They also set agendas, make arrangements for committee, board and other meetings, and compile and distribute minutes.

These workers also have research and analysis tasks rarely found among administrative executive assistants. For example, they analyse incoming and outgoing submissions and reports, and prepare and present summaries and reports to the executive, committees and boards of directors. They also conduct research, collect data and prepare papers for the executive, committees and boards of directors. This research may include meeting with individuals, special interest groups and others on behalf of the executive, committees and boards of directors to discuss issues, assess problems and recommend action.

All workers in this category work extensively with computerized tools, such as word processing and financial software.

©Stone/Vancouver

Example Titles

- committee clerk
- corporate secretary
- executive secretary
- executive assistant
- legislative assistant

Education and Training

Those who wish to work as *executive assistants* with policy and analysis responsibilities usually require a bachelor's degree in public administration, political science or a related discipline, followed by related administrative experience in a junior position. For positions with administrative responsibilities, a diploma in business, office administration or public administration, plus several years of related clerical or secretarial experience, is usually sufficient.

Business and commerce undergraduate programs usually include courses relevant to public administration. Undergraduate programs in business administration, commerce and political science are available at public universities in B.C., many with a co-op option. Most university colleges and the British Columbia Institute of Technology offer a bachelor's degree in business administration. The Open University offers a Bachelor of Business Administration with options in business management and public sector management. In addition, most colleges and university colleges offer business certificate and diploma programs with courses that transfer to universities. These programs prepare graduates for entry-level positions in both public and private enterprises. Admission requirements generally include grade 12, with a strong background in mathematics and English.

Camosun College has Local Government Administration certificate and Public Administration diploma programs, designed for people already working in the area as well as those with limited or no previous work experience. The University of Victoria (UVic) offers diploma programs in local government management and public sector management. Admission to these UVic programs generally requires two years' post secondary education plus three years' experience.

Capilano College offers a Local Government Administrative Professional Certificate for people employed by B.C. municipalities, regional districts, First Nations governments, improvement districts or supporting agencies to increase their knowledge of political and organizational realities of local government in B.C.

College of the Rockies offers a Public Administration Certificate with a management in aboriginal communities major. The Nicola Valley Institute of Technology has a Diploma of First Nations Public Administration program.

Organizational skills, oral and written communication skills and interpersonal skills are needed for these positions. Those working in policy and analysis require initiative, strong analytical powers and an ability to make decisions and solve problems.

Working Conditions

Workers in this occupational group tend to work in a standard office setting with regular office hours. However, after-hours or weekend work is common. This job requires keeping track of many different types of detail and being very well organized. It also requires the ability to work diplomatically with people. Executive assistants may have to participate in many meetings. Much of the work requires the use of computerized information systems.

The general wage level (including part-time and part-year workers) in this occupational group is above the provincial average, at $35,000 per year. This is because there are relatively few part-time workers in this group. At $40,000, the salary of full-time, full-year workers in this group is very close to the provincial average. The overall provincial average for full-time, full-year workers' salaries is $39,400. Recent college graduates who found work as executive assistants reported an average monthly salary of $2,220. For those who work for the full year, that will mean an annual starting salary of about $27,120.

In 1998 there were 1,390 people employed as executive assistants in B.C., up from 1,060 in 1990. Self-employment among this group is rare, although supplying related research or reporting services on a contract, per-job basis may be possible. Only 3% of executive assistants reported being self-employed, compared to 15% of the workforce in general. About 12% of executive assistants work part time, below the 26% average for all workers in the province.

The unemployment rate among executive assistants is lower than the average for all occupations. There are no general conditions that would cause this work to be seasonal, though workers employed in industries with seasonal patterns, such as forestry, may be subject to decreases in the availability of work.

Executive assistants are employed across a wide range of industries. The largest employers of this group are the finance, insurance and real estate field, which employs 11% of the workers, and government, which employs another 10%. Generally, government positions are more likely to have the policy and analysis responsibilities mentioned previously. Workers in this field are employed in more than 30 industries, though actual numbers are small because this is a small occupational group. Employment is concentrated in the Lower Mainland, where 77% of the work is located. (Overall, 57% of the total workforce is in the Lower Mainland.) Fewer than 350 people work as executive assistants in the rest of the province. As they work with executives, these workers are concentrated in large offices and corporate headquarters.

A large majority (89%) of executive assistants are women. It is worth noting that there is a very large discrepancy between the salary of men and women in this occupational group. Men earned on average $62,900 for full-time, full-year employment in 1995, whereas women earned only $37,900. Men are more likely to have university degrees (37% of men, compared to only 16% of women), and women are more likely than men to have college diplomas.

It may be that many women in senior administrative support positions have the title executive assistant and are receiving the lower salaries associated with clerical/secretarial work.

There are very few workers in the 15 to 24 age group, 4% compared to 15% of the overall workforce. This suggests that this is not entry-level work. The average age of executive assistants is 41.

Employment Prospects

This is a small occupational group, with employment estimated at a total of 1,390 executive assistants in B.C. in 1998. Projections from the Canadian Occupation Projection System (COPS) call for a growth rate of 2.8%, much faster than the average for all occupations. The small size of this group means that even with high growth there will only be a total of 870 employment openings from 1998 to 2008. About half of these will be to replace retiring workers.

Several factors could act to reduce the employment growth rate in this occupation below the COPS forecasted rate. The largest employers of *executive assistants*, the finance, insurance and real estate industry and government, are both experiencing sluggish employment growth. Very few employment opportunities for these workers are expected to be in the public sector. There are technological factors that may contribute to the above average growth. There is an increasing proportion of these specialized workers among all clerical and administrative support positions as computers continue to reduce the number of clerical jobs for staff performing routine data transcription tasks. Since executive assistants are able to perform a wide range of tasks and to use technology effectively, there is a growing justification for hiring these professionals.

Executive assistant positions are at the top of the administrative support hierarchy. It is not uncommon for workers in these positions to progress to the management stream. Indeed, some employers actually use these positions to provide developmental opportunities for promising employees in order to prepare them for management positions. Executive assistant positions are used as training grounds in this way because they provide a broad overview of the various aspects of the executive function. The skills gained through this type of work may be transferable to a range of other jobs, such as managing a small business or event planning. Those who do policy and analysis work may have a broader range of advancement opportunities, including senior management.

Related Occupations

- administrative officers (1221)
- executive secretary (in 124 secretaries)
- conference and event planners (1226)

Personnel and Recruitment Officers

NOC 1223

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	1,140	1,530	1,980

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
450	470	920

Annual Growth 1998-2008 2.6%

Main Industries of Employment

Other Business Services	21%
Federal Administration	11%
Education	10%

Employment by Region

Lower Mainland	67%
Vancouver Island	17%
Northern B.C.	6%
Okanagan/Kootenay	10%

Self-employment 9%

Nature of the Work

Personnel (human resources) and *recruitment officers* identify and advertise job vacancies, recruit candidates and assist in the selection and reassignment of employees. They are employed throughout the private and public sectors. There are relatively few workers in this occupational category.

In larger organizations, this role may be broken down among a number of specialist positions, each responsible for various human resources management tasks. These areas include recruitment and selection, wage and salary administration, employee benefits administration, and pensions administration.

Main Duties

Recruitment officers perform a variety of tasks, depending on the needs of their organization. Mainly, their work is to fill vacancies, working with management and supervisory personnel within their organizations. They also assist more senior human resources specialists. These workers will identify current and potential vacancies, post notices and advertisements, and collect and screen applications. They set up and participate in selection boards to evaluate job candidates, and advise managers and employees on staffing policies and procedures.

Recruitment officers work directly with potential employees to help find the most suitable applicants for positions. They advise job applicants on employment requirements, review applicant lists and arrange interviews, and recruit graduates of colleges, universities and other educational institutions. They notify applicants of the results of competitions. In some cases they may supervise personnel clerks.

Wage and *salary administrators* work to make sure that wages and salaries are set and maintained according to classification procedures. *Employee benefits administrators* track and administer benefit plans, such as medical/dental insurance and disability insurance. *Pensions administrators* maintain and administer pension records for staff.

At this level of responsibility, it's increasingly common for workers to have a range of general human resources duties rather than to be highly specialized. In many organizations, it's likely that a human resources officer will do many types of work associated with all of the specialties mentioned, including recruitment.

Example Titles

- human resources officer
- industrial relations officer
- personnel selection officer
- placement officer
- recruitment officer
- staffing analyst
- staffing officer

Education and Training

These occupations usually require a diploma or a bachelor's degree in business administration, human resource management, commerce, psychology or sociology, although graduate degrees are becoming more common. Competition for entry-level positions is high so part-time or summer experience in a human resource office is an asset.

The University of British Columbia (UBC) offers an industrial relations management option within its bachelor's degree in commerce. Simon Fraser University (SFU) and the University College of the Cariboo offer a human resource management concentration within their bachelor's degree in business administration. The British Columbia Institute of Technology has a two-year Human Resource Management Diploma Program and a nine-month Human Resource Management Post-diploma Program for those who have earned at least a diploma of technology. Camosun College offers a Human Resource Management Certificate Program with all courses transferable to Camosun College's business or public administration diploma programs. The Open Learning Agency and most colleges and university colleges offer one- to two-year business administration/management programs that include human resource management courses.

Royal Roads University grants graduate degrees in Business Administration in Human Resources Management and in Conflict Analysis and Management. UBC, SFU and the University of Victoria also offer master's degrees in business administration with courses in human resource management.

There are many educational opportunities offered through various continuing education divisions. These include SFU's Management Skills in Advanced Technology and Certified Employee Benefit Specialist Program and the Justice Institute of B.C.'s Conflict Resolution Certificate Program.

A *personnel* or *recruitment officer* who becomes a member of the B.C. Human Resources Management Association (B.C. HRMA), or other approved human resources association, such as the Greater Victoria Human Resources Management Association, is eligible for designation as a Certified Human Resources Professional. Certification by the B.C. HRMA recognizes professional achievement, commitment to a high ethical standard and knowledge of recent developments through continuing professional development.

Human resource officers require excellent written and oral communication skills. They must be able to establish rapport with people of all educational and occupational backgrounds, and they must be able to work as part of a team. They should have good negotiation skills and must be able to use diplomacy and tact to encourage cooperation between employers and employees during disputes. Knowledge of computer databases and processing systems is very important, as are skills in analysis and skills in developing and implementing policies, programs and procedures.

Working Conditions

Workers in this occupational group tend to work in larger organizations and in a standard office setting. Normal hours of work would include a 35 to 40 hour week during regular office hours, although some after-hours or weekend work may be required. Workers can expect to be called upon by employees and job applicants and must be prepared to deal tactfully with occasionally difficult situations. The work requires the use of computerized information systems.

Workers in this group have above-average earnings. All workers, including those who worked part time or part year, earned an average of $34,600 in 1995, compared to the all-occupation provincial average of $27,900. Workers employed full time for the full year earned $41,900, compared to the provincial average of $39,400. Recent college graduates who found work as human resources officers reported an average monthly salary of $2,730. For those who work for the full year, that will mean an annual starting salary of about $32,800.

This is a small occupational group. The job has similarities with other human resources functions, but it is not as common as either the more junior personnel clerk or the more senior human resources specialist. In 1998 there were 1,530 people in these occupations in B.C., up from 1,140 in 1990.

Self-employment among this group is not common. Only 9% of human resources officers report being self-employed, which is lower than the average self-employment rate of 15%. This low self-employment rate is similar to the rate among human resources specialists, which would suggest that human resources work generally has not seen a lot of self-employment. However, many human resources professionals are employed by specialized consulting and recruitment firms, which have developed to provide services to clients who need extra human resources support. This means an increase in contract and other flexible employment options, which may also mean increased possibilities for self-employment.

There are currently few part-time workers in these occupations, with only 14% working part time. However, industry sources believe that alternative work arrangements, including part-time work, will increase. The unemployment rate among human resources and recruitment officers is lower than the average for all occupations. There are no general conditions that would cause this work to be seasonal, though workers employed in industries with seasonal patterns (such as forestry) may be subject to seasonal decreases in the availability of work.

Human resources and *recruitment officers* are employed in small numbers across a wide range of industries. The most significant industry for employment of this group is business services, which includes employment agencies and management consulting services. In 1998 these services employed 21% of those working in these occupations. A large percentage, more than 30% in total, work throughout the public and quasi-public sector, including federal and regional government, health care and education.

Most human resources and recruitment officers in B.C. work in cities where business service organizations and large government employers are located. Two-thirds of human resources and recruitment officers (67%) work in the Lower Mainland region, and another 13% are employed in the Greater Victoria region. (On average, 57% of the workforce are in the Lower Mainland and 9% in Victoria.) Of the remainder, 10% of workers are in the Okanagan/Kootenay region and 6% are in Northern B.C.

Most (72%) human resources and recruitment officers are women. At an average age of 40, the workers in this group tend to be slightly older than the provincial average. In addition, 61% of these workers are between 35 and 55 years old, compared to 49% for all occupations in B.C.

Employment Prospects

This is a very small occupational group, made up of only about 1,530 workers in B.C. in 1998. Projections call for a growth rate of 2.6%, much faster than the average for all occupations. This growth is largely due to the numerous adjustments that are taking place in the labour force, which reflect a rapidly changing and technologically evolving economy. The volume and complexity of work for those in these occupations increases with worker turnover in companies and organizations and with the upgrading of workers' skills required to meet the demands of the ever-changing economy. However, as this is such a small occupational group, this growth projection only results in 920 employment openings across the province between 1998 and 2008.

Growth for this occupational group is tied to growth in the largest employing industry for this group of workers, the "other business services" industry. This industry includes employment agencies and management consulting services. It is growing much faster than the overall B.C. economy because companies and organizations are becoming more willing to hire consultants, such as recruitment agencies, to do specialized work. These companies often don't want full-time specialists on their payroll. The value of the field of human resources management is also becoming more recognized, which may contribute to growth in this area. The process of working for a collection of clients (rather than one large organization) is expected to increase part-time and contract opportunities.

Government is currently a major employer of these workers, but employment in this sector is expected to grow more slowly than the all-industry average from 1998 to 2008. Consequently more opportunities will be found in private sector organizations, such as those mentioned above.

Employers hire workers through a range of recruitment methods. Often workers are found through informal contacts and business networks or through advertisements in newspapers. Workers with a general range of skills will probably have greater opportunities for employment than those who are very specialized (see Main Duties).

With experience and extra training, there is some room to move into this position from junior positions, such as personnel clerk. With experience it is also possible to advance to human resources officer and management positions. As these occupations become more regulated, however, additional training and formal qualifications will probably be essential to advance to such human resource specialist positions.

Additional Information

B.C. Human Resources Management Association
http://www.bchrma.org

Related Occupations

- personnel clerks (in 144 administrative support clerks)
- specialists in human resources (1121)
- training officer and instructor (in 4131 college and other vocational instructors)
- human resources managers (in 01/09 middle and other management)

The most significant industry for employment of this group is business services, which includes employment agencies and management consulting services.

Property Administrators

NOC 1224

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	5,880	7,070	8,940

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
1,870	2,110	3,980

Annual Growth 1998-2008 2.4%

Main Industries of Employment

Finance, Insurance, and Real Estate	87%
Construction	3%
Other Business Services	2%

Employment by Region

Lower Mainland	67%
Vancouver Island	18%
Northern B.C.	4%
Okanagan/Kootenay	12%

Self-employment 30%

Nature of the Work

Property administrators perform administrative duties and coordinate activities related to the management and rental of investment property and real estate on behalf of property owners. They are employed by property and real estate management companies, property owners, development companies and government.

Main Duties

Property administrators supervise the day-to-day operation of residential and commercial buildings. They are often responsible for finding tenants. They arrange or approve rental or lease of various properties on behalf of property owners, and they make sure that the terms of lease agreements are met. They make sure that problems reported by clients or tenants are resolved.

Property administrators also oversee property maintenance and services. They prepare and administer contracts for providing services, such as cleaning, maintenance and security. They inspect properties regularly and make sure problems are corrected and appropriate repairs and improvements are carried out. They monitor the progress and cost of maintenance and renovation work for property owners. They are usually responsible for staffing and may hire and supervise rental agents, property clerks, building superintendents or other support staff. Finally, they compile and maintain records on operating expenses and income.

There is a professional distinction between licensed *property managers* and unlicensed *building managers*, although the titles are often used interchangeably. Property managers are also licensed real estate agents who manage a commercial portfolio on behalf of owners. Building managers are hired by property managers or owners to perform the more routine tasks of running a building, such as collecting rents and inspecting units.

Example Titles

- accommodation officer
- building manager
- leasing coordinator, property
- property administrator
- property manager
- property officer

Education and Training

Building managers usually require one or two years of high school. Basic mathematics and reading skills are needed. Previous cleaning and maintenance experience is helpful. Some on-the-job training is common. Post secondary education is useful for those who wish to advance.

Vancouver Community College (VCC) offers a three-month Building Service Worker Certificate program. Admission requires grade 10 or equivalent. A six-month extended version of the program is offered for students with disabilities, and a five-month version is offered for students who need extra English as a Second Language (ESL) training.

Building managers require some knowledge of electrical, plumbing, carpentry and other construction trades. An ability to operate industrial machinery and to communicate effectively with others are important skills. Analytical skills and adaptability to change are assets. These workers need to be able to work on their own with little or no supervision.

Property managers usually have at least a high school diploma plus business experience. Graduation from a program in business may be required. Several years of administrative experience as a property clerk, contract clerk or administrative officer may also be required. Computer and accounting skills are generally necessary.

The Real Estate Council of British Columbia issues property management licences in the name of individuals who complete certain requirements. To become a property manager requires completion of a pre-licensing course and examination, which is offered through distance education from the University of British Columbia. Other post secondary institutions that offer programs that prepare students to write the property management examination include the British Columbia Institute of Technology (BCIT), Camosun College, VCC and Langara College. Within one year of passing the exam the individual must be employed by an agent or company and then must apply to the Real Estate Council of B.C. for a licence. A licensed property manager may become an agent, who is permitted to own or be legally responsible for a property management or sales company. Requirements include a significant amount of additional education as well as at least two years' licensed experience.

Another relevant program offered by BCIT is a two-year Marketing Management program, which contains a commercial real estate studies option. Applicants to the BCIT program require high school graduation.

Some employers require that property managers have additional credentials. The Institute of Real Estate Management (IREM) offers courses leading to a designation of Certified Property Manager (CPM). To become a CPM requires five years of experience and completion of the IREM program. This generally follows completion of a degree or college qualification in business administration, with some specialization in real estate and property appraisal studies. Once the CPM designation has been achieved, mandatory continuing education is required in order to maintain membership.

The Professional Association of Managing Agents (PAMA) offers a designation of Certified Professional Residential Property Manager (CPRPM) to individuals who complete program requirements. Required courses are offered by Camosun College, VCC, Langara College and Okanagan University College.

The Building Owners and Managers Institute offers a Real Property Administrator (RPA) designation for industrial and commercial property specialists. Candidates must successfully complete seven courses within the RPA program and three years of verifiable property management experience. Courses are available in three formats, which are classroom, self-study and accelerated review.

VCC's Continuing Education department offers the Building Manager (Residential) Certificate program. This program is tailored to meet the educational needs of on-site resident managers in apartment buildings and other multi-family properties and is supported by PAMA. Some of these courses may be completed independently of the certificate program that may serve the needs of residential and commercial property managers.

Property managers must be able to communicate well, both orally and in writing, negotiate effectively and deal with a variety of people, including owners, staff, contractors and tenants. They should be diplomatic and patient, flexible and adaptable, organized and prompt. Property administrators usually enjoy working with people, making decisions, being creative and working independently. Individuals with backgrounds in real estate, accounting, business administration and business management may find their skills useful in this field, as would those with special skills in plumbing, heating and air conditioning or construction.

For a description of similar employment see the profile Real Estate Agents and Salespersons (6232).

Working Conditions

Residential building managers often work and live in buildings they manage and may be called on to deal directly with immediate tenant concerns or emergencies. Though office hours may be set, property administrators may be required to work evenings or weekends. Licensed property managers must also have accreditation as real estate agents, but this does not necessarily mean that they are actively selling real estate.

In total, the workers in this occupational group have about average level of earnings, according to 1995 salary figures. The average salary of all property administrators, including part-time workers, was $29,200, compared to $27,900 for all occupations in B.C. However, workers in this occupation who were employed full time for the full year earned $35,700, compared to the provincial average of $39,400.

Recent college graduates who found work as property administrators reported an average monthly salary of $2,090. For those who work for the full year, that will mean an annual starting salary of about $25,100. Above-average earnings in this field are made by licensed property managers and those with real estate designations such as Certified Property Managers.

In 1998 there were 7,070 people in this occupational group, up from 5,880 in 1990. Self-employment is quite common, as administrators may wish to contract with a number of property owners. In 1995, 30% of property administrators reported being self-employed, compared to 15% of the workforce overall. There is an above-average level of part-time workers in this occupation, with 30% working part time.

The unemployment rate among property administrators is lower than the average for all occupations. There are no general conditions that would cause this work to be seasonal.

Property administrators are employed mainly in the finance, insurance, and real estate industry. In 1998 this sector employed 87% of those employed in this occupation. Other administrators are employed by government organizations that may own a few properties, such as municipal governments or social service providers (for example, housing for seniors).

Geographically, property administrators are somewhat more concentrated in cities than are other occupations. For example, 67% work in the Lower Mainland (compared to about 57% of the workforce overall), and another 12% are employed in the Victoria region (compared to 9% on average). Of the remainder, 12% are reported in the Okanagan/Kootenay region and only 4% in Northern B.C.

The proportion of men and women in this occupational group is very close to the proportion for all occupations in B.C., with women making up 45% of the workers. Compared to other occupations, property administrators are significantly older. One-quarter of these workers are between 55 and 64 years old. A total of 62% of property administrators are over 45 (including a large group over 65), and their average age is 49. By comparison, only 32% of the B.C. workforce is over 45, and the average age is 38. Building managers are often retired or semi-retired or otherwise using the position as an income supplement. They usually receive lower salaries than licensed property managers.

Employment Prospects

This is a large occupational group, with 7,070 workers in B.C. in 1998. Projections from the Canadian Occupation Projection System (COPS) call for an employment growth rate of 2.4%, much faster than the average for all occupations. This projection implies that between 1998 and 2008 a total of 3,980 openings will become available. About half of these openings (53%) are forecast to become available because of people retiring, with the remainder to come from growth in the number of new jobs.

There are several factors contributing to the high employment growth. As the wholesale and retail trade industries continue to develop new and existing properties, many openings for *property administrators* are expected to be created. With an aging population, there will be an increasing need for property managers to operate new facilities, such as assisted living arrangements and retirement communities. The increasing stock of apartments, condominiums and town houses should also require more property administrators. Another source of new demand is the new home developments that are being organized increasingly with community or homeowner associations. These associations often require the services of property administrators to aid in the provision of community services and manage jointly owned common areas.

There are two factors that could act to reduce the employment growth in this occupational group. The first is that employment growth in the finance, insurance and real estate industry, which employs the large majority of workers in this group (about 87%), is expected to be sluggish. The second is that new construction of apartments and condominiums is currently very low due to buyers' concerns about potentially leaky properties.

Many of the new job openings for building managers through to 2008 will be to manage condominiums rather than traditional rental accommodations. These managers may work for property management firms contracted by individual condominium councils.

Workers are often recruited for these jobs through newspaper advertisements and sometimes through employment agencies. Workers with three to five years' experience in related jobs, such as property clerks, may also be eligible for internal promotion.

It may be possible to move up to other positions in real estate with experience and additional training. This is especially true of licensed property managers.

Additional Information

Institute of Real Estate Management http://www.irem.org

Professional Association of Managing Agents
http://www.landcentre.ca/pama

Building Owners and Managers Institute
http://www.bomi-edu.org

Real Estate Council of B.C.
http://www.realestatecouncil.bc.ca

Real Estate Institute of Canada http://www.reic.ca

Related Occupations

- property clerk (in 144 administrative support clerks)
- real estate salespersons and agents (6232)
- building superintendents (in 666 cleaners)

Purchasing Agents and Officers

NOC 1225

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	1,660	1,970	2,680

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
710	620	1,330

Annual Growth 1998-2008 3.1%

Main Industries of Employment	
Wholesale Trade	13%
Hospitals	7%
Wood Manufacturing	6%

Employment by Region	
Lower Mainland	63%
Vancouver Island	15%
Northern B.C.	7%
Okanagan/Kootenay	15%

Self-employment 2%

Nature of the Work

Purchasing agents and *officers* purchase general and specialized equipment, materials and business services for use or for processing by their establishment. They are employed by medium-sized and large organizations throughout the public and private sectors.

Main Duties

Purchasing agents purchase general and specialized equipment, materials or business services for use or for processing by their establishment. They determine what their organization needs to buy to keep functioning. They evaluate the requirements of their establishment and develop specifications for equipment, materials and services to be purchased. They also apply and sometimes help determine general purchasing policies.

Purchasing agents then oversee the process of acquiring goods and services, by asking for tenders, consulting with suppliers and reviewing price quotations. Once they've gathered this information, they set contract terms and conditions and award contracts to specific vendors. They set delivery schedules, track progress and contact clients and suppliers to correct problems.

These workers must also provide information to other departments and suppliers regarding orders, and they may hire, train or supervise purchasing clerks. In large or specialty organizations, purchasing agents may specialize in purchasing particular materials or business services, such as furniture or office equipment.

The efficiencies brought about by computerized systems allow workers to expand their duties into more complex tasks. In the past their time may have been completely taken up by responding to immediate needs within their companies. This meant manually completing routine tasks, such as preparing tenders and purchase orders. Now they spend more time to plan and research purchasing needs. This may mean working to establish relationships with suppliers that secure the best prices, services and delivery options on all *potential* purchases.

It can also involve complicated analysis of total costs of purchases rather than just unit costs. For example, a new piece of accounting software may have a higher purchase price than a competitive package but require less time in staff training and no upgrade of existing computer hardware. A good purchasing officer will be able to find out all these costs and benefits.

©Stone/Vancouver

Example Titles

- contracting officer
- contract management officer
- material management officer
- procurement officer
- purchaser, furniture and furnishings
- purchasing agent
- purchasing officer
- supply management officer

Education and Training

There are several ways to become a *purchasing agent* or *officer*. Individuals with a high school diploma can start in an entry-level position, such as purchasing clerk, expediter, junior buyer, or by working in departments where stock is processed, such as stores and shipping/receiving. Courses in purchasing and buying are available through continuing education divisions of universities, university colleges, colleges and institutes and are definite assets for those who wish to advance. Individuals with courses, college diplomas or university degrees in business administration, economics or commerce may be able to start at a higher level and advance more quickly. Certificate and diploma programs in business are available at all B.C. colleges. Business and commerce undergraduate programs are also available at B.C. universities and university colleges. Some employers require a specialized background, such as chemistry or engineering, in order to purchase industrial products. Business experience is helpful.

The Purchasing Management Association of Canada (PMAC) offers a Certified Professional Purchaser (CPP) Accreditation program, Canada's only legally recognized designation for the supply management profession. Although there are no educational requirements for enrolling in this program, candidates who have courses in business may qualify for advanced standing in the CPP program. Most B.C. post secondary institutions offer these courses, and the College of the Rockies offers a certificate in purchasing. The CPP program involves completion of mandatory courses in accounting, economics, marketing, law, organizational behaviour and management, plus a number of electives. In addition, individuals must complete PMAC seminars, 10 management studies courses and three to six years of work experience. Once all program requirements have been met, students must complete a one-week advanced purchasing management course and then write the CPP National Written Exam. The program must be completed within 10 years from the date of registration. CPP holders must report their activities each year to the institute in order to ensure they meet the maintenance requirements.

Purchasing agents and officers must possess good communication skills, be able to work with many kinds of people and be excellent negotiators. They must be analytical, creative and able to spend large amounts of money responsibly. They need to be able to make decisions and work independently. A good memory is required, and computer skills are usually necessary.

Working Conditions

Workers in this occupational group tend to work in larger organizations and in a standard office setting. Normal hours of work reflect a "9-to-5" pattern, though after-hours or weekend work may be required occasionally. Workers need to keep track of many small projects and to provide information to co-workers and suppliers. Much of their work takes place in the context of computerized information management systems.

Computerized inventory management and ordering systems have allowed workers to be more efficient in the basic tasks of their work, and as a result, workers are taking on more complex tasks. There is a change in emphasis from purchasing to supply management. Many routine tasks, such as placing orders, may be done by the employees or departments needing supplies, so purchasing officers can prepare for future needs by negotiating deals with suppliers and investigating products and services. Changes in the complexity of the work of purchasing officers have meant a growing emphasis on formal training for these workers. Workers may be expected to take on training opportunities through their employer or on a part-time basis.

Workers in this group have above-average earnings, according to 1995 salary figures. All workers, including those who worked part time or part year, earned on average $40,000, compared to the provincial all-occupation average of $27,900. Workers employed full time for the full year earned $42,700, compared to the provincial average of $39,400. Recent college graduates who found work as purchasing officers reported an average monthly salary of $2,820. For those who work full time for the full year, that will mean an annual starting salary of about $33,800.

This is a small-sized occupational group. In 1998 there were 1,970 people in these occupations in B.C., up from 1,660 in 1990. Self-employment among this group is rare. Only 2% of purchasing agents report being self-employed, compared to 15% of the workforce overall. Generally, a purchasing officer needs to be very knowledgeable about the company's activities and policies, so self-employment is less likely.

There are very few part-time workers in this occupation, with only about 6% of workers working part time. Purchasing agents tend to be employed in large or medium-sized companies. Those who do purchasing for smaller companies may also have other duties of a clerical or administrative nature. They may purchase part time but spend the rest of their time on other responsibilities.

The unemployment rate among purchasing agents is lower than the average for all occupations. There are no general conditions that would cause this work to be seasonal, though workers employed in industries with seasonal patterns (such as forestry) may be subject to reduced availability of work.

Purchasing agents and *officers* are employed across a wide range of industries. The largest industry for employment of this group in the province is wholesale trade. This sector employs 13% of those employed in this group. Purchasing officers are needed in many workplaces, so they are found in about 40 industries, including electronic and electrical products, professional business services and construction.

Geographically, purchasing agents in B.C. are spread out much like the workforce overall. A few more than average work in the Lower Mainland region (63% compared to 57% of the total workforce), while somewhat less than average work on Vancouver Island (15% compared to 18% for the total workforce), and somewhat less than average work in Northern B.C. (7% compared to 10% of the total workforce).

A majority of purchasing agents are men. A little more than one-third (37%) of workers in this group are women. Compared to other occupations, people in this field tend to be a little older. With 38% of the workers in the 35 to 44 year-old range, compared to 28% for the total workforce, this suggests that purchasing agents and officers is a mid-career position. The average age of workers in this field is 42.

Employment Prospects

This is a small occupational group, made up of 1,970 workers in B.C. in 1998. Projections from the Canadian Occupation Projection System (COPS) call for a growth rate of 3.1%, much faster than the average rate for all occupations. Between 1998 and 2008 a total of 1,330 openings are forecast to become available. About half (47%) of these openings are because of people retiring, with the remaining 53% coming from growth in new jobs.

Several factors could act to reduce the employment growth rate of this occupational group below the COPS forecasted rate. These workers are found across all industries, and this may contribute to a growth rate closer to the all-occupation average. Workers are more productive due to computer systems that are increasingly being used to track business activities and to re-order parts and supplies automatically when inventories hit lower threshold levels. The increasing preference of some companies to enter into long-term contracts with suppliers will result in companies negotiating fewer contracts with suppliers. These changes in technology and in purchasing policies will act to reduce the need for the services of these workers and could lower employment growth.

Employment in this group is not particularly vulnerable to downturns in specific industries because it is found across so many industries, but it is affected more by changes in organizations and technology. Automation and increased efficiency levels may have a negative effect on employment. However, as the role of these workers expands into proactive supply management, they often become more useful to their employers than when they were processing purchasing requests manually.

Self-employment positions or positions in a contracting company may be a source of employment growth for this occupational group. With long-term contracts between purchasing and supplying companies, it may be cost effective for purchasing companies to hire private contractors or the services of a contracting company on demand. This may open up opportunities for administrative workers to specialize in this field.

Competition for these employment openings is expected to be keen because of the number of qualified post secondary graduates and others with appropriate experience looking for training positions in this field. Workers may attain purchasing duties through a number of routes. Often they are promoted from related clerical or administrative jobs, or jobs in company warehouses. Because they are the ones best equipped to understand and describe technical requirements of specialized materials, professional or technical staff may move into purchasing.

Progression to positions such as purchasing manager is possible with experience. With training and experience, workers may also be qualified to move into related managerial positions in materials management and accounting.

Additional Information

Purchasing Management Association of Canada
http://www.pmac.ca

B.C. Institute of the Purchasing Management Association of Canada *http://www.bci-pmac.bc.ca*

Related Occupations

- purchasing and inventory clerks (in 147 recording, scheduling and distributing occupations)

- retail and wholesale buyers (6233)
- purchasing managers (in 01/09 middle and other management)

Conference and Event Planners

NOC 1226

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	860	1,010	1,400

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
390	320	710

Annual Growth 1998-2008 3.3%

Main Industries of Employment

Other Service Industries	16%
Other Business Services	15%
Accommodation and Food Services	12%

Employment by Region

Lower Mainland	70%
Vancouver Island	16%
Northern B.C.	5%
Okanagan/Kootenay	8%

Self-employment 18%

Nature of the Work

Conference and *event planners* plan, organize and coordinate conferences, conventions, seminars, trade shows, festivals and other events. They are employed by tourism associations, trade and professional associations, convention and conference centres, governments, and by conference and event planning companies. Though it's growing quickly, this is still a small occupational group in this province.

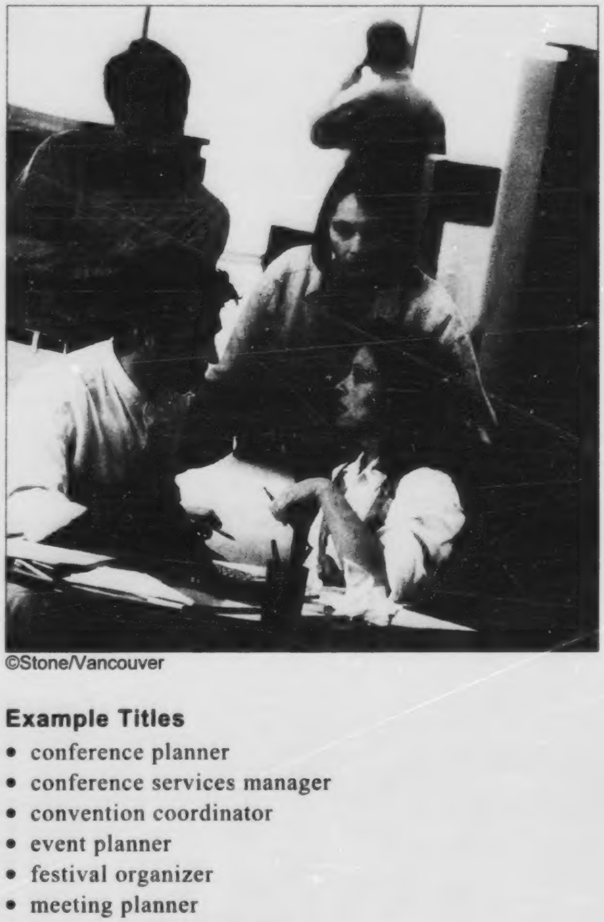
Main Duties

Conference and *event planners* must plan and manage all aspects of large meetings or other functions. To get the process off the ground, planners meet with trade and professional associations and other groups to promote and discuss conference, convention and trade show services. They also meet with sponsors and organizing committees to decide the size and format of events, to set and monitor budgets and to review administrative procedures and progress of events.

Planners coordinate services for events, such as accommodation and transportation for participants, conference and other facilities, catering, signage, displays, translation, audio-visual equipment, printing and security. They also organize the registration of participants, prepare programs and promotional material, and publicize events. A big part of this responsibility may be in marketing to potential attendees or delegates and convincing them to come. Particular sorts of gatherings require that planners set up entertainment and social gatherings for participants.

Planners often are responsible for recruiting, training and supervising staff required for events. These staff members may be paid workers or volunteers. Planners must be able to work with both paid and unpaid workers. They must also be able to assign work and delegate responsibility to staff and suppliers or sub-contractors. Planners are on hand during events to make sure things run smoothly and to trouble-shoot as problems arise. Finally, they are responsible for financial matters and approve invoices, maintain financial records and prepare reports.

There may be some specialization of duties that make conference, meeting and convention planners distinct from festival and event planners. Conference and meeting planners often work in the context of large convention or accommodation facilities, such as hotels. In this setting, accommodation and food services, pre-registration, and so on, become more important. These workers are more likely to have steady work with a single employer. In the case of festivals and events, special considerations are the coordination of entertainment, large public venues, such as parks or concert halls, and mass marketing to the general public.



©Stone/Vancouver

Example Titles

- conference planner
- conference services manager
- convention coordinator
- event planner
- festival organizer
- meeting planner
- special events organizer
- trade show planner

Education and Training

Graduation from a recognized tourism or recreation program is quickly becoming a recognized standard for hiring *conference* and *event planners*, although it is not always required. Several years of experience in hospitality, tourism administration, marketing or public relations may be just as important as formal education for entry into these occupations.

The University College of the Cariboo offers an Events and Conventions Management Diploma, which provides a practical overview of the skills and knowledge required to plan, organize, manage, promote and evaluate a festival, convention, trade show or event. In addition, certificate and diploma programs in tourism, hospitality, hotel and restaurant management or business administration are available at most colleges and university colleges, the British Columbia Institute of Technology and the Open Learning Agency. Most universities offer bachelor degree programs in tourism and business administration. The University of Victoria offers a bachelor's degree in commerce with a concentration in tourism management. In general, grade 12 is required for admission to diploma and undergraduate programs.

The complex work of conference and event planning requires a number of skills, and those in this field should be comfortable with computers, accounting, logistics, marketing, promotions, negotiations and human resource management. Skill at making decisions, solving problems and coordinating a diverse group of detailed tasks and responsibilities is necessary. Public relations abilities, excellent oral and written communication skills and good interpersonal skills are required. Being able to work as part of a team is important. Continued education is required in order to remain competitive.

Working Conditions

Workers in this occupational group tend to do their work in a range of settings. Though they may have an office, much of the work may need to be done on-site at hotels and convention centres and may require visits to suppliers of various conference materials. After-hours or weekend work is likely, as are periods of intense labour and long hours before and during events. Event planners work under pressure with many people and must be able to respond tactfully and creatively to difficult situations. This is clearly demanding work that requires the ability to think on your feet, coordinate many details and learn from experience. It can also be exciting work, providing opportunities to meet people from many backgrounds.

Workers in this group have earnings slightly below the provincial average, according to 1995 salary figures. The overall average earnings of all workers in this group is $23,300 per year, compared to the all-occupation provincial average of $27,900. Workers employed full time for the full year earned $35,100 compared to the provincial average of $39,400. Recent college graduates who found work as *conference* and *event planners* reported an average monthly salary of $2,030. For those who work full time for the full year, that will mean an annual starting salary of about $24,400.

This is a small occupational group. In 1998, 1,010 worked as conference and event planners, up from 860 in 1990.

Planning an event usually requires a lot of work for a very short period of time, so it is well suited to contract work and consulting. Traditional jobs, where workers work full time for a single employer, are rare. Most workers will work for more than one client or employer. Self-employment among this group is quite common, and conference and event planners can often be flexible in the amount of work they take on. The nature of the work does not require a high initial investment in equipment. A home-based office, with computer, fax and telephone, may be enough to get started. In 1995, 18% of conference and event planners reported being self-employed, compared to 15% of the workforce overall.

Only 44% of workers in this field report working full time for the full year. Full-time, part-year work is the situation of 32% of workers in this field, and another 25% work part time only, for all or part of the year. It's not known how much of the part-time or part-year work was by choice or was dictated by the availability of projects. Contract work and self-employment are seen to be strong trends in these occupations and may be especially attractive to those who want some flexibility in the amount of work they take on. (This does not, however, change the fact that *some* periods of long hours will probably be necessary in planning any event.)

The unemployment rate for this occupational group is lower than the average for all occupations. Seasonal work especially affects festival planners, as the bulk of these events occurs in the summer. On the other hand, conferences and conventions may not be heavily booked through the summer, but it can be a busy time for planning.

Conference and event planners are employed in a range of industries. About 12% of workers are employed by the amusement and recreational service industries for the planning and implementation of special events in music, festivals and fairs, the arts, sports and other entertainment. The business services industry (for example, management consulting services) also employs 15% of the conference and event planners in the province. Small numbers also work in other sectors, including advertising and government.

Geographically, conference and event planners are concentrated in the Lower Mainland region, where 70% find work (compared to 57% of the workforce overall). Vancouver Island provides employment for 16%, 8% work in the Okanagan/Kootenay region, and 6% work in Northern B.C.

The large majority (72%) of conference and event planners are women. Compared to other occupations, conference and event planners tend to be younger. One-half of the workers are less than 35 years old, compared to 40% for the B.C. workforce. The average age for this occupation is 37.

Employment Prospects

This is a small occupational group, made up of only about 1,010 workers in B.C. in 1998. Projections call for a growth rate of 3.3%, much faster than the average for all occupations. However, as it is a small occupational group, between

1998 and 2008 only 710 positions will become available. About half (45%) of these openings are from people retiring, while the remainder will come from growth in the number of new jobs.

Growth of this occupational group can be linked to a number of trends. In general, British Columbia is becoming more popular as a tourist destination, both within Canada and internationally. This is responsible in part for the high employment growth in the accommodation and food services sector, which employs about 12% of conference and event planners. In addition, new facilities are increasing the capacity of the province to accommodate large meetings. There is also a movement to establish and extend professional and industry associations in various fields, which provides a larger potential market for group meetings and conferences. The business services sector, which employed about 15% of conference and event planners in 1998, is also growing, as more companies and organizations contract experts for specific tasks, such as conference planning, rather than relying on in-house staff.

Competition for events may heat up over the next few years as the convention industry in Seattle, Washington, works to expand its business. If Seattle is successful in expanding, and if it is at the expense of Vancouver and Whistler convention business, this may somewhat reduce the employment growth for conference and event planners in B.C.

Competition for employment is expected to be keen despite the high growth rate because of the number of qualified post secondary graduates, and others with appropriate experience, looking for positions in this field. Many career seekers pursue this line of work because of its variety and interest. Educational institutions throughout the province have responded to this demand by training more people. As a consequence, despite anticipated high growth, there is a surplus of qualified people seeking careers in this occupational group. Those wanting to get into this field can still expect to encounter stiff competition in finding work. Training is available around the province, but most of the work is centred in the Lower Mainland. As a result, program graduates and others starting out in this occupation may find their best opportunities in and around Vancouver.

It is possible to progress into paid work through volunteer experience. Conference and event planners may also work their way into the field through related jobs in the hospitality sector, such as front desk clerk. Newspaper ads are rarely used to recruit these professionals. Occasionally, training institutions with related programs will be approached to recommend qualified people. Usually, once a person becomes known in a community, work is found through contacts. A combination of hospitality sector experience and post secondary training is especially attractive to employers.

Conference planners gain experience managing a wide range of activities and are therefore qualified for a range of administrative and managerial tasks. With experience, it is possible to move up to related positions in marketing or hospitality management or to progress to managing larger and more lucrative events.

Additional Information

Canadian Tourism Human Resource Council
http://www.cthrc.ca

Related Occupations

- sales representatives, wholesale (6411)
- front desk agents (6435)
- administrative officers (1221)
- executive assistants (1222)
- occupations in public relations (in 512 writing, translating and public relations professionals)

Court Officers and Justices of the Peace

NOC 1227

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	200	280	350

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
70	80	150

Annual Growth 1998-2008 2.3%

Main Industries of Employment

Provincial and Territorial Administration	78%
Local and Other Administration	11%
Federal Administration	10%

Employment by Region

Lower Mainland	57%
Vancouver Island	22%
Northern B.C.	3%
Okanagan/Kootenay	18%

Self-employment 0%

Nature of the Work

Court officers organize the administration and procedures of federal and provincial courts, such as scheduling trials and overseeing the maintenance of court records. *Justices of the peace* administer oaths, issue subpoenas, summonses and warrants and perform other court-related duties. They are employed by federal and provincial courts. This is a very small occupational group.

Main Duties

Court officers do a range of administrative tasks for provincial and federal courts. They organize administrative services and set work priorities for court staff. They also schedule court trials and arrange pre-trial conferences and hearings. They are responsible for information management, such as recording court commencement, trial proceedings and judgements, and overseeing the maintenance of judicial records. They also have responsibilities for court finances, in that they collect and record court-ordered fines and fees.

Often court officers are also justices of the peace. With the additional authority of this position, *Justices of the peace* (JPs) can do work associated with official court documents. They can issue subpoenas, summonses and warrants (including search warrants) and receive affidavits, declarations and affirmations. They can perform procedures, such as administering oaths and granting adjournments. They may also release defendants on judges' orders and explain the defendants' rights and obligations.

Example Titles

- commissioner of marriages
- commissioner of oaths
- court administrator
- court clerk
- court clerk supervisor
- court manager
- court officer
- court registrar
- deputy registrar
- justice of the peace
- manager, court services
- registrar of bankruptcy
- sitting justice of the peace
- supreme court registrar
- trial coordinator

Education and Training

The Court Services Branch of the B.C. Ministry of the Attorney General usually employs new staff members at entry-level positions. Through a combination of on-the-job training and work experience, employees can develop the skills and knowledge required to advance. Progression is from entry-level positions, such as clerk and cashier, through more senior positions, such as *justice of the peace* and *court officer*, to top level positions, such as manager or director of court services.

Hiring for entry-level positions is performed through the Recruitment Access Office of the Public Service Employees Relations Commission. Eligible applicants must have grade 12, and some post secondary education is preferred. In addition, work experience in general office procedures, use of computers and filing is required. Applicants must be able to type 40 wpm. Court officers often hold a university degree in business, public administration or law, or a college diploma in a related area. Legal training may be advantageous for those who want to become justices of the peace.

Diploma programs in business are available at all B.C. public colleges and university colleges. Admission requirements generally include grade 12, with a strong background in mathematics and English. Bachelor's degrees in business administration or commerce are available at public universities, most university colleges, the B.C. Institute of Technology and the Open University. As well, most colleges and university colleges offer university transfer courses in business. Admission to these programs requires graduation from secondary school, with a strong background in mathematics, business and English.

Capilano College offers a Legal Assistant Diploma program. This program includes a mandatory six-month practicum under the supervision of a lawyer. Applicants should have two years of prior university transfer course work or equivalent prior learning experience.

The Justice Institute of B.C. provides training for court managers and administrators and for court and registry clerks.

Law degrees are available at the University of British Columbia and the University of Victoria. They require at least three years of undergraduate study before admission. See the profile Lawyers (411) for specific details.

Generally, people in these occupations need good communication skills, and they must be able to deal with the public in a confident and courteous manner. They must be able to work independently but also as a member of a team. Those in upper level positions require leadership, management and supervisory skills.

Working Conditions

Workers in this occupational group work in public buildings and courthouses. Normal hours of work are standard office hours, though some after-hours or weekend work may be required, depending on specific demands. Though their main work is administrative, workers can expect to be required to respond tactfully to occasionally difficult situations.

In some cases, in larger judicial centres, a court officer with a JP (justice of the peace) designation will perform only the duties of a JP, as a sitting justice, rather than a combination of court officer duties and JP duties. There is also an additional designation of commissioner of oaths, which allows a court officer to take on additional duties administering oaths.

Workers in this group have good earnings, according to 1995 salary figures. All workers, including those who worked part time or part year, earned on average $37,700, compared to the all-occupation provincial average of $27,900. Workers employed full time for the full year earned $46,000, compared to the provincial average of $39,400. However, earnings do vary considerably depending on the level of responsibility of the position.

Within the provincial Court Services Branch, the entry-level positions are classified as Office Assistant II, and the starting salary ranges from about $28,000 to $31,800 for a full-time, full-year job. (Workers in these jobs are *not* considered court officers, but this is usually the starting point for experience and promotion.) Higher classifications (for example Court Clerk III) filled by workers with more experience have a salary range of $34,500 to $39,300 for a full-time, full-year job.

In 1998 there were only 280 people in this occupational group in B.C., up from 200 in 1990. Self-employment as a court officer is not possible practically, as it is a specialized function required by the public courts. It is possible for justices of the peace to work independently, combining their authority as JP with other administrative or business service roles. In fact, none of the workers in this classification report being self-employed, compared to 15% of the workforce overall.

There is a below-average level of part-time work in this group, with about 22% of workers working part time. However, industry sources expect part-time and contract opportunities to increase, in part because of general trends toward workers who can provide only as much work as is needed, when it is needed. The unemployment rate among court officers and JPs is lower than the average for all occupations. There are no general conditions that would cause this work to be seasonal.

Court officers and *justices of the peace* are employed almost wholly by governments at the provincial, federal and local level. The provincial government employs 78%, and another 22% work for other levels of government.

In general, workers in this occupational group tend to be spread throughout the province, much like the average for all occupations. However, Northern B.C. is underrepresented with only 3% of the workers. The Lower Mainland accounts for 57%, 22% are employed on Vancouver Island, and 18% are reported in the Okanagan/Kootenay region.

The majority (66%) of court officers and JPs are women. This compares with only 46% for the B.C. entire workforce. Workers in this group are noticeably older. About 60% of these workers are between 35 and 54 years old. Only 18% are less than 35, compared with 40% of the entire workforce. Their average age is 46, compared with 38 years of age for all occupations.

Employment Prospects

This is a very small occupational group, made up of only about 280 workers in B.C. in 1998. Projections from the Canadian Occupation Projection System (COPS) call for an employment growth rate of 2.3%, faster than the average for all occupations. However, as it is such a small occupational group, only 150 positions will become available between 1998 and 2008. About half (53%) of these openings are from people retiring, with the rest resulting from growth in new jobs.

Several factors could act to reduce the employment growth rate of this occupational group below the COPS forecasted rate. The main employers of this group are the provincial government, which employed 78% of these professionals in 1998, and the federal government, which employed 10%. Both of these levels of government are expected to experience sluggish employment growth through to 2008.

Because of low numbers of employment openings and strong competition generally for most government employment, competition for openings will continue to be strong. Industry sources indicate that currently there is a surplus of qualified internal candidates eligible and waiting for these opportunities.

The age and relatively high salary of workers in this occupational group suggests that this is not a first or entry-level job but one that requires experience and promotion. Workers interested in this area almost always enter these occupations through junior clerical positions, such as the province's Office Assistant II designation. From there, workers apply for internal promotions. This usually means that those with an office assistant position move into a position as a court clerk, then as a senior court clerk. Progression to senior positions, such as senior court manager, is possible with experience. Hiring for very senior positions (such as a sitting justice of the peace) may be done through publicly-advertised competitions.

Additional Information

B.C. Public Service Employee Relations Commission
Recruitment Access Office http://rao.gov.bc.ca
http://rao.gov.bc.ca/tempjobs.htm

Justice Institute of B.C. http://www.jibc.bc.ca

Related Occupations

- court clerks (in 144 administrative support clerks)
- sheriffs and bailiffs (in 646 occupations in protective service)
- administrative officers (1221)
- paralegal and related occupations (4211)
- lawyers (4112)

Immigration, Employment Insurance and Revenue Officers

NOC 1228

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	1,770	2,250	2,790

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
540	670	1,210

Annual Growth 1998-2008 2.2%

Main Industries of Employment

Federal Administration	87%
Finance, Insurance, and Real Estate	7%
Provincial and Territorial Administration	6%

Employment by Region

Lower Mainland	68%
Vancouver Island	18%
Northern B.C.	4%
Okanagan/Kootenay	10%

Self-employment 0%

Nature of the Work

This occupational group includes government officers who administer and enforce laws and regulations related to immigration, employment insurance (formerly called unemployment insurance), customs and tax revenue. Each major group has different duties, based on the laws and programs they enforce. All work directly with the public to help explain requirements and how to meet them. They are also required to set and carry out penalties in cases of violations. They are employed by federal government agencies.

Main Duties

Immigration, employment insurance and *revenue (customs) officers* are all required to explain and enforce laws, government regulations and policies. Each group has different specific responsibilities. However, possible changes in the structure of federal offices may result in the positions of immigration and customs officers being combined in some cases.

Duties of *immigration officers* include providing information and guidance about regulations and procedures to prospective clients. These officers decide whether people seeking to enter Canada meet admission regulations by examining their documents and conducting interviews. They grant landed-immigrant status and admit people, or else order their detention or deportation. They perform some investigative work in finding and holding people thought to be breaking immigration laws. When needed, they help to deport people by getting authorization from receiving countries and getting necessary travel documents.

Revenue (customs) officers question people at border points to check that their goods can be admitted to Canada and calculate and collect the amount of duty owed. They inspect baggage to find undeclared merchandise, or illegal goods and board vehicles and vessels arriving from foreign countries to make sure the cargo meets customs and commerce laws. They inform manufacturers and shippers of customs laws and procedures. They also prepare reports and help in searching and seizing records and in preparing charges for court cases.

Employment insurance officers provide information and guidance about regulations and procedures to prospective clients and check claimants' information, such as reasons for job loss and availability for work. They decide whether people applying for employment insurance benefits are eligible and monitor the payments of benefits throughout the length of a claim. They also investigate claimants suspected of fraud or abuse.

Example Titles

- customs inspector
- customs officer
- employment insurance agent
- immigration agent
- immigration officer
- immigration examining officer
- revenue officer
- tax collection officer
- tax enforcement officer
- unemployment insurance agent

Education and Training

These jobs are considered entry-level civil service officer positions. Hiring of federal employees is controlled by the federal Public Service Commission (PSC). Individuals interested in becoming an *employment insurance, immigration* or *revenue officer* must apply to a specific position advertised on the PSC Recruitment Information Line. The telephone number can be found in the Blue Pages of the local telephone directory under the Government of Canada section, Public Service Commission of Canada. The PSC also has a recruitment site on the Internet (see Additional Information below).

After an initial screening process the PSC invites applicants to write an exam. Employment and immigration officers take a federal public service exam, and customs officers write a similar but separate customs exam.

Although the minimum education required is grade 12, competitive conditions may result in those with more education being hired. College or university education, fluency in a second language and administrative or regulatory experience are all useful. Senior positions generally require a university degree and relevant experience in dealing with people.

The language requirements for specific positions vary and are based on the duties. Some positions require the use of only one of the two official languages. For positions where immediate bilingual capability is not required language training at government expense may be provided. Where service needs require immediate bilingual capability candidates are tested to determine whether their language skills are sufficient.

Newly-hired officers are given several weeks of training prior to induction and orientation. Graduates are then placed on the job and given several months of training under supervision. Ongoing training is expected for all employees.

These employees must possess good interpersonal and communication skills. They must be able to communicate with people in a firm but tactful manner and, at the same time, be able to treat all different types of people with patience and respect. They must be emotionally stable, cooperative and reliable. They must be attentive to detail, with good judgement and good decision-making skills. Computer skills are an asset.

Working Conditions

All workers in this group deal extensively with the public. The work probably will require extensive use of computerized information systems. *Employment insurance officers* usually work regular office hours in well-equipped offices, though some after-hours or weekend work may be required. Both *customs* and *immigration officers* often work shifts in isolated locations, and they must wear uniforms. They may be required to work after-hours and to meet with clients and violators outside their main office. All federal employees in this field are union members.

With government downsizing and with new processes and procedures, especially for those working in the area of employment insurance, working conditions may have become more stressful for some workers in this occupational group.

Workers in this group have above-average earnings, according to 1995 salary figures. All workers, including those who worked part time or part year, earned on average $33,000, compared to the all-occupation provincial average of $27,900. Workers employed full time for the full year earned $39,300, compared to the provincial average of $39,400. Recent college graduates who found work in these occupations reported an average monthly salary of $2,210. However, industry sources suggest that the starting salary for these positions in 1999 was between $32,800 and $38,800 for a full-time, full-year job.

In 1998 there were 2,250 people in this occupational group in B.C., up from 1,770 in 1990. Self-employment as an employment insurance or immigration officer is not possible, as these are specialized functions required by the federal government. It may be possible to find related work as a self-employed immigration consultant. Customs officers may also be able to work independently in combination with other administrative or business service roles. In fact, no workers in this field report being self-employed, compared to 15% of the workforce overall.

There is also a low proportion of part-time work in this group, with only about 13% of workers working part time, compared to the provincial average of 26%. The unemployment rate in this occupational group is lower than the average for all occupations. There are no general conditions that would cause this work to be seasonal.

These officers are employed almost exclusively by the federal government (87%). Another 6% are employed by the provincial government. The only other significant industry for employment of this group is finance, insurance and real estate. It's probable that this latter group, 7% of the occupational group as a whole, works in the finance sector in customs and importing work or perhaps in advising immigrants.

Geographically, this group of workers is somewhat more likely than average to work in the Lower Mainland, where 68% are found (compared to 57% of the workforce overall). Vancouver Island has 18% of these workers, and the less densely populated areas of the Okanagan/Kootenay region and Northern B.C. only account for 13% of the total.

This occupational group employs a slight majority (56%) of women. There are few workers in this field under 25 years of age, but 66% fall between the ages of 25 and 44 (compared to a workforce average of 53% in this age range). The average age of all workers in this occupation is 38, with little difference between the average age of the men and women. The concentration of workers in the early years of their career is explained by the nature of the positions. These workers tend to have post-secondary education and/or work experience, so they would be entering the job in their 20s. In addition, it is considered an entry-level public service position, so many will eventually progress to more senior positions.

Employment Prospects

This is a medium-sized occupational group, made up about 2,250 workers in B.C. in 1998. Projections from the Canadian Occupation Projection System (COPS) call for a growth rate of 2.2%, faster than the average rate for all occupations. Between 1998 and 2008 a total of 1,210 positions will become available. Just over one-half of these openings will result from people retiring, with the rest coming from new job growth.

Several factors could act to reduce the employment growth rate of this occupational group below the COPS forecasted rate. Computer systems are increasingly being used to keep track of and organize records and information for which these professionals are responsible. This increased efficiency will continue to reduce the number of openings for these professionals. In addition, the main employers of this group are the federal government, which employed 86% of these professionals in 1998, and the finance, insurance and real estate industry, which employed 7%. Both of these sources of employment are expected to experience sluggish growth through to 2008.

Competition for these employment openings is expected to remain keen because of the number of qualified post secondary graduates and others with appropriate experience looking for positions in this field. However, due to the aging workforce in the federal government, recruiting policies are designed to ensure that older workers are replaced by younger workers, which means hiring externally. Qualified youths will have a competitive advantage through to 2008.

According to government sources, work for employment insurance officers can be particularly uncertain as it is sensitive to many factors, including changes in legislation, technology and general economic conditions. A downturn in employment, for example, means more work for employment insurance officers in the short term.

Clerical workers already employed in federal offices can be promoted to these positions, but they must write the public service exam and achieve a suitable result before they become eligible for promotion (See Education and Training.). Internal promotion to these positions is becoming less frequent, and the federal government is now doing more external hiring. Progression from the positions in this category to managerial positions is possible with experience.

Additional Information

The Public Service Commission of Canada has a site on the World Wide Web that lists openings nationally and describes application procedures. *http://jobs.gc.ca*

Related Occupations

- customs, ship and other brokers (1236)
- financial auditors and accountants (1111)
- other financial officers (1114)
- policy and program officers (416)
- employment counsellors (4213)
- government managers (in 01/09 middle and other management)

Bookkeepers

NOC 1231

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	18,480	19,960	22,050

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
2,090	3,000	5,090

Annual Growth 1998-2008

1.0%

Main Industries of Employment

Professional Business Services	23%
Retail Trade	14%
Construction	11%

Employment by Region

Lower Mainland	46%
Vancouver Island	18%
Northern B.C.	15%
Okanagan/Kootenay	21%

Self-employment

31%

Nature of the Work

Bookkeepers maintain complete sets of books, keep records of accounts, check the procedures used for recording financial transactions and provide personal bookkeeping services. They are employed throughout the private and public sectors, or they may be self-employed. There are many bookkeepers in this province.

Main Duties

The main responsibility of all *bookkeepers* is to keep financial records and set up, maintain and balance various accounts for their clients. They do calculations and check financial transactions for their employers or clients, and they make sure good records are kept, according to legal requirements and good business practices. To do this, they use computerized and manual bookkeeping systems.

Specifically, they post journal entries and reconcile accounts, maintain general ledgers and prepare financial statements. They calculate and prepare cheques for payrolls and for utility, tax and other bills. They complete and submit tax forms, workers' compensation forms, pension contribution forms and other government documents. They also prepare tax returns and perform other personal bookkeeping services and prepare other statistical, financial and accounting reports.

Example Titles

- accounting bookkeeper
- bookkeeper

Education and Training

©Stone/Vancouver

There are several routes to becoming a *bookkeeper*. One of these is by completion of a one or two-year community college program in accounting and business procedures. Another is by completion of two years of a recognized professional accounting program (such as Chartered Accounting, Certified General Accounting). Yet another is by completion of courses in bookkeeping and accounting through continuing education or correspondence programs, combined with several years of progressive experience in the field.

The minimum qualifications required vary from employer to employer, but most look for employees who have at least high school graduation, with courses in accounting, computers and business and office procedures, plus experience as a financial or accounting clerk. Completion of a college program that includes mathematics, electronic bookkeeping and basic accounting is more advantageous.

On-the-job training may be provided for some positions, and most employers allow a period of time for new bookkeepers to become familiar with the particular operations and procedures of the company.

Individual bookkeeping and accounting courses are available at most B.C. colleges and university colleges through office administration and business administration/commerce programs and are also available through continuing education departments at public universities. Most colleges and university colleges also offer one- and two-year accounting and business administration programs. For those who wish to advance, pursuit of an accounting designation, such as a Certified General Accountant (CGA), or a bachelor's degree in business administration is advisable. For more information on training as an accountant see the profile Financial Auditors and Accountants (1111).

Virtually all bookkeepers now use computer software programs for their work. Upgrading courses and programs in computer skills are offered by many colleges and university colleges.

Bookkeepers must be organized, detail-oriented professionals. They must be able to work well on their own with limited or no supervision and also as members of a team. Strong communication skills are necessary in order to explain, verbally and in written form, complicated accounting matters to managers, employers and others who may not have financial expertise.

Working Conditions

Every business is required to keep books, so *bookkeepers* may work for any sort of company or organization. The work tends to be in an office, and hours of work are generally standard office hours, though some after-hours or weekend work may be required. During the tax preparation season especially, bookkeepers can expect to work unusually long hours. Bookkeepers must be prepared to work with computerized bookkeeping and accounting systems.

Workers in this occupation earn well below the provincial average, and those with little experience often make minimum wage. In 1995 the average salary for *all* bookkeepers was only $20,300. This low level of earnings is due to the large numbers of bookkeepers who work part time or part year and to a generally lower wage level. In 1995 the average salary for bookkeepers who worked full time for the whole year was $27,600, compared to the provincial average of $39,400. Recent college graduates who found work as bookkeepers reported an average monthly salary of $1,580. For those who work for the full year, that will mean an annual starting salary of about $19,000. Wage rates from around B.C. suggested hourly non-union rates starting at minimum wage and reaching about $20 an hour in some cases, though the average is at the lower end. Union wages will generally start at a higher level.

This is a very large occupation. In 1998 there were 19,960 bookkeepers in B.C., up from 18,480 in 1990. Self-employment among this group is common, and many bookkeepers work for several clients. About 31% of bookkeepers report being self-employed, compared to 15% of the workforce overall. Start-up costs for self-employed bookkeepers can be lower than many other self-employment options. Initially, a computer, the right software and a telephone line can outfit an office sufficiently.

Many small or medium-sized businesses may only need to contract for a small amount of bookkeeping services, rather than having a full-time employee. Only 34% of workers in this field report working full time for the full year. Another 15% work full time, but for part of the year only. There is a very high number of people working part time in this occupation, 51%, compared with the provincial average for part-time work of 26%. Available information doesn't indicate whether the part-time and part-year work is by choice or because some bookkeepers cannot find as much work as they would like. Depending on what individual bookkeepers take on, this occupation can provide flexibility in hours of work for those who want it. The unemployment rate among bookkeepers is lower than the average for all occupations.

The tax preparation season (January to May) is the busiest for bookkeepers. Bookkeepers working in industries affected by seasonal conditions (for example, forestry and construction) will probably face seasonal slowdowns or even layoffs.

Bookkeepers are employed in virtually every industry in the province. The most significant sector for employment of this group is professional business services, which employs about 23% of the province's bookkeepers. The retail sector employs 14% of those working in this occupation. The construction industry is also a major employer.

Despite the fact that bookkeepers offer a service to businesses, this is less of an urban occupation than many other professional services. Workers are more likely than average to live outside the Lower Mainland. Only 47% of bookkeepers work in the Lower Mainland, compared with 57% of the workforce as a whole. Another 7% are employed in the Victoria region. Of the remainder, 11% live in other areas of Vancouver Island, 21% are in the Okanagan/Kootenay region, and 15% are in Northern B.C.

At 92%, women dominate this occupation. Bookkeepers have a representation of workers in various age ranges, with a slightly older average age. There are few people (5%) under 25, compared to 15% for the workforce as a whole, and more than half of the workers are between 25 and 44 years old. The average age for bookkeepers is 42.

Employment Prospects

This is one of the largest occupational groups in the province, made up of 19,960 workers in B.C. in 1998. Projections call for a growth rate of 1.0%, slower than the average for all occupations. Despite the slow growth, the large size of this group will still mean a large number of employment openings. A total of 5,090 openings is expected between 1998 and 2008. Most of these openings (59%) will result from the need to replace workers who retire. The remainder will result from growth in the number of new jobs.

There are a number of reasons for the slow employment growth projected for this occupational group. Office automation and accounting software packages have increased the productivity of bookkeepers. These factors have also reduced the demand for these professionals across all industries. Bookkeeping duties increasingly are being integrated with the regular duties of other clerical support staff.

Since this occupation is found across so many industries, its employment is not particularly vulnerable to economic downturns in specific industries. It is affected by changes in organizations and technology. With office automation increasing the efficiency of bookkeepers, self-employment is becoming more common. One bookkeeper can provide services to multiple organizations from a home-based office. Office automation has also permitted many organizations that would otherwise hire a full-time bookkeeper, to hire only on a part-time basis. Consequently many of the openings between 1998 and 2008 will be filled by self-employed-contractors and part-time workers.

In all regions of the province, up-to-date experience with popular computer packages is essential for those who are either self-employed or seeking employment in this field. Competition for business in small communities is quite strong. Experience as a bookkeeper may make it easier to transfer into other clerical or administrative jobs that require bookkeeping.

Work as a *bookkeeper* can be a good start for a career in related occupations in accounting and other financial occupations. These occupations frequently offer higher earnings but do require additional training. It is possible for bookkeepers to move into accounting by taking additional training, often available through part-time study, for certification, such as the CGA, Certified General Accountants.

Related Occupations

- finance and insurance clerks (143)
- financial auditors and accountants (1111)

Loan Officers

NOC 1232

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	2,830	3,410	4,130

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
720	540	1,260

Annual Growth 1998-2008	1.9%

Main Industries of Employment

Finance, Insurance, and Real Estate	91%
Retail Trade	3%
Education	2%

Employment by Region

Lower Mainland	62%
Vancouver Island	19%
Northern B.C.	7%
Okanagan/Kootenay	12%

Self-employment	1%

Nature of the Work

Personal banking officers (loan officers) examine, evaluate and process credit and loan applications. The titles "personal banking officer" and "personal banking representative" are new and reflect recent changes in many financial institutions. Many of these workers now perform other client services, such as investment and savings counselling or selling investment funds. They are employed by banks, trust companies, credit unions and similar financial institutions.

Main Duties

The traditional job of the *loan officer* was centred around processing and approving loans. The job has changed dramatically in recent years to focus more heavily on the sale of financial products and services, such as investments funds. The duties of most loans/personal banking officers now include responsibilities in both of these areas.

Specifically, in the administration of loans, personal banking representatives will interview applicants for personal, student and business loans, and for mortgages. They provide information to clients regarding loan options, rates, etc., and promote credit and loan services. They may approve or reject applications or make recommendations to management for approval or rejection. They also prepare statements on delinquent accounts and forward bad debts for collection.

On the sales side, personal banking officers market bank products to clients and help clients choose investment methods. This includes helping clients identify financial goals and plan to meet goals. They also sell investment packages, such as mutual funds and RRSPs.

Example Titles

- credit officer
- loans officer
- mortgage officer
- personal banking officer
- personal banking representative

Education and Training

Loan officer/personal banking officer positions are seldom entry-level positions. Generally, people work their way up to these positions from within an institution, and it is only when eligible candidates are not available from within that applications are accepted from outside. Usually loan officers start as customer service representatives and, through experience and on-the-job training, acquire the skills and knowledge required to become a loan officer. With recent changes in the economy, the competition for entry-level positions is much higher than in the past, and more applicants have college diplomas or undergraduate degrees in business administration or commerce.

With the expanding role of personal banking representatives, completion of the Canadian Security Course and the Conduct and Practices Handbook for Securities Industry Professionals Course (CPH) offered by the Canadian Securities Institute (CSI) may be required. As well, the Investment Funds in Canada Course (mutual funds) offered by the Institute of Canadian Bankers may be required. These courses must be completed within one year and are offered by correspondence.

Business diploma programs are available at all B.C. public colleges and university colleges. These programs prepare graduates for entry-level positions in both public and private enterprises. Admission requirements generally include grade 12, with a strong background in mathematics and English.

Undergraduate programs in business administration and commerce are available at most public universities in B.C. Various concentrations or options are available, including accounting, finance, international business, marketing, policy analysis and human resource management. As well, the British Columbia Institute of Technology, Open University and most university colleges offer bachelor's degrees in business administration. Admission to undergraduate programs requires graduation from secondary school, with a strong background in mathematics, business and English.

Upgrading programs to meet entrance requirements for both college and university programs are available at most colleges throughout the province.

Personal banking officers must have excellent listening and negotiating skills, sales skills and problem-solving skills. They should take the initiative and be detail and achievement oriented. They should enjoy working with people as well as numbers. Ongoing professional development is necessary in order to stay in touch with the new services that financial institutions offer as well as the application of new computer technology.

Working Conditions

Workers in this occupational group work in banks or financial institutions. Normal hours of work are Monday to Friday, though some institutions offer extended evening and weekend hours. This job requires a professional, discreet attitude. Much of the work will require extensive use of computerized information systems.

According to 1995 salary figures, all workers, including those who worked part time or part year, earned on average $34,600, compared to the all-occupation provincial average of $27,900. Earnings of all workers are higher than average because few personal banking officers work part time, but the full-time, full-year earnings match the provincial average. Workers employed full time for the whole year earned $39,400. Workers with a higher than average level of training or experience can expect to earn above-average salaries.

Recent college graduates who found work as personal banking officers reported an average monthly salary of $2,260 (this would include both full- and part-time work). For those who work for the full year, that will mean an annual starting salary of about $27,100. Industry sources suggest a somewhat higher starting salary for full-time work of about $30,000 per year, with experienced, qualified workers able to earn as much as $55,000 a year.

In 1998 there were 3,410 people in this occupational group in B.C., up from 2,830 in 1990. Realistically, self-employment among this group is not possible, as it is necessary to work within the bank to process loans. Only 1% of personal banking officers report being self-employed. There is a low level of part-time work in this group, with 12% of workers working part time. However, part-time work is becoming more popular, as banks and other financial institutions hire extra help to increase the number of hours staff are available to clients.

The unemployment rate among personal banking officers is lower than the average for all occupations. There are no general conditions that would cause this work to be seasonal.

Most (91%) *loan* and *personal banking officers* are employed in the finance industry by banks, trust companies, credit unions and other financial institutions. A few are also employed by other industries that deal in credit, such as the retail trade, where stores may offer the service of arranging loans for purchases.

Geographically, personal banking officers are slightly more concentrated in the Lower Mainland than average. Approximately 62% work in the Lower Mainland, compared to about 57% of the total workforce. Another 19% work on Vancouver Island. The Okanagan/Kootenay region reports 12%, and the Northern B.C. region reports 7%.

The large majority (71%) of personal banking officers are women. There are very few (5%) of these workers under 25 years of age, compared to 15% for the workforce as a whole. However, there are also slightly fewer workers than average who are older than 45. This suggests that personal banking officer is a mid-career position, not an entry level one. The average age is 38.

Employment Prospects

This is a medium-sized occupational group, made up of 3,410 workers in B.C. in 1998. Projections from the Canadian Occupation Projection System (COPS) call for a growth rate of 1.9%, faster than average for all occupations. This will result in 1,260 employment openings between 1998 and 2008. Most of these openings (57%) will result from growth in new jobs. The rest will result from the need to replace workers who retire.

High employment growth for this group is partly attributed to banks and other financial institutions expanding the range of financial products and services that they provide. This will tend to increase potential business undertaken with banking clients. For example, a wide range of investment products, such as investments funds, that were formerly only sold by brokers are now available through loans officers. According to industry sources, office automation has also changed the work of loans officers. As a result of the increased focus on the sale of financial products and the increased use of technology, the knowledge and skill requirements of these workers has increased. They will face more changes as financial products and technology continue to change. This will put more stress on workers and may increase worker turnover, in turn increasing employment opportunities.

Several factors could act to reduce the employment growth rate of this occupational group below the COPS forecasted rate. The main employer of this group, the finance, insurance and real estate industry, which typically employs about 91% of these professionals, is experiencing sluggish growth. According to industry sources, many foreign banks are now providing banking and loan services through the Internet and other telecommunications equipment. This means that many openings for *loan officers* will be lost to foreign banks. Employment growth of loan officers is also being slowed by increased computerization and office automation. Telephone banking, bank machines and other electronic banking are decreasing the number of workers needed to meet routine client needs. In some cases bank management is increasing the responsibility of former customer service representatives to include some of the duties previously performed by more senior workers, such as loans officers.

It is probable that at least half of the projected openings in this occupational group will be filled internally by customer service representatives and clerks being promoted to these positions. This is the most common way banks fill these openings. Usually, banks need to train personal banking officers in their own product lines and the technology they use, so workers acquire skills and knowledge through working in junior positions in the bank. A person considering a career as a personal banking officer may want to try this route. Similarly, working as a personal banking officer may help provide experience to qualify for more senior positions in credit and loan management.

Banks rarely have to advertise to fill these jobs or other entry level jobs. They occasionally participate in job fairs, where they collect large numbers of applications for a range of positions. For the most part though, job seekers should apply directly to the human resources section of banks for which they would like to work.

Additional Information

Canadian Securities Institute http://www.csi.ca

Canadian Bankers Association http://www.cba.ca

Institute of Canadian Bankers http://www.icb.org

Related Occupations

- bank tellers, credit/loan clerks (in 143 finance and insurance clerks)
- banking, credit and other investment managers (in 01/09 middle and other management)

It is probable that at least half of the projected openings in this occupational group will be filled internally by customer service representatives and clerks being promoted to these positions. This is the most common way banks fill these openings.

Insurance Adjusters and Claims Examiners

NOC 1233

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	2,430	3,040	3,670

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
630	480	1,110

Annual Growth 1998-2008 1.9%

Main Industries of Employment

Finance, Insurance, and Real Estate	87%
Rail Transportation	3%
Other Business Services	3%

Employment by Region

Lower Mainland	77%
Vancouver Island	11%
Northern B.C.	5%
Okanagan/Kootenay	6%

Self-employment 5%

Nature of the Work

This category covers two related but separate jobs. *Insurance adjusters* investigate insurance claims and decide how much of the loss or damages is covered by insurance policies. They are employed in claims departments of insurance companies or as independent adjusters. *Insurance claims examiners* are generally senior to adjusters and examine claims investigated by insurance adjusters and authorize payments. They are employed at head offices or branches of insurance companies. Most motor vehicle insurance adjusters and claims examiners in B.C. work for the Insurance Corporation of British Columbia (ICBC).

Main Duties

Insurance adjusters' duties are centred around making sure insurance claims are properly honoured according to the policy and individual circumstances. They investigate circumstances of insurance claims to decide if claims are valid by inspecting automobiles, homes or other damaged property. They also gather information from claimants, accident witnesses, doctors and others, and examine records or reports. Once they've gathered the information, they determine how much of the loss or damages is covered by insurance policies and negotiate the settlement of claims. They also prepare adjustment reports.

Claims examiners review, examine and authorize insurance claims investigated by insurance adjusters. They examine adjusters' reports and similar insurance claims to decide the extent of insurance coverage and to make sure that claims are valid and that settlements are made according to company practices and procedures. They also consult lawyers, doctors or other experts to discuss insurance claims. Once they've established that the claim is in order, they approve automobile, fire, life, disability, dental or other insurance claims.

Example Titles

- adjuster
- claims examiner
- insurance adjuster

©Stone/Vancouver

Education and Training

Adjusters and *examiners* require at least grade 12, plus some post secondary education or several years' experience as a clerk in a claims department or other general insurance experience. Most have college diplomas or university degrees in business administration or a closely related field. Preference is given to those who have general industry knowledge, relevant business experience and experience in research, decision-making or investigation (in areas such as fraud or arson, for example). Experience in construction estimating is an asset. Generally, employers provide on-the-job training specific to the nature of the work, and continuing education to stay abreast of relevant information is encouraged and provided.

Although the Insurance Corporation of B.C. (ICBC) will accept various combinations of education and experience, automobile claims examiner trainees usually require post secondary education as well as several years' relevant business experience. An entry-level insurance adjuster would typically complete the Claims Adjuster Trainee Program and several years of customer-service-related business experience, including a few years in a telephone claims adjusting role. Both these positions require a valid B.C. driver's licence.

Programs in business administration, commerce or economics are offered by most B.C. colleges, university colleges and universities.

Continued education is recommended in order to remain competitive in this field. Those who complete certain educational programs delivered through the Insurance Institute of British Columbia are entitled to professional recognition as an Associate of the Insurance Institute of Canada (AIIC) and later as a Fellow of the Insurance Institute of Canada (FIIC). AIIC is recognized as the hallmark of the insurance professional, and the designation is not awarded until a student has been employed for at least one full year in the insurance industry. The FIIC is a management-based professional program with many courses that transfer to many universities towards a business degree.

Those who work for independent adjusting firms must pass a qualifying examination in order to obtain the required professional licensing provided by ICBC.

Adjusters and examiners should enjoy working with detail and evaluating information and should be comfortable working with numbers. They should be able to make decisions quickly and communicate effectively, both verbally and in writing. They should be able to remain calm and impartial when they are dealing with people who may be excited or irritated. They may need to be imaginative and/or aggressive to get information. Knowledge of computers and adaptability to change are important.

Working Conditions

People in this occupational group work for insurance companies, usually in a standard office setting during working office hours. However, investigating claims often requires leaving the office to speak with people or view damages. Depending on the claim, this could mean anything from having to examine a car wreck at an auto yard to meeting with a police officer at the end of an evening shift. The level of responsibility and difficulty of the work varies. At an entry-level job, an adjuster may be performing simple clerical work and applying rules to clear cases. More senior adjusters may investigate questionable claims actively and work with a variety of experts to arrive at a decision.

Workers in this group have above-average earnings, according to 1995 salary figures. All workers, including those who worked part time or part year, earned on average $42,000, compared to the all-occupation provincial average of $27,900. Workers employed full time for the full year earned $44,600, compared to the provincial average of $39,400. Recent college graduates who found work in these occupations reported an average monthly salary of $2,730. For those who work for the full year, that will mean an annual starting salary of about $32,800. Industry sources suggest that an experienced, well-qualified adjuster or claims examiner can expect to earn up to $80,000 a year.

In 1998 there were 3,040 people in this occupational group in B.C., up from 2,430 in 1990. Self-employment among this group is possible, as independent adjusters sometimes work on a fee-for-service basis. However, only 5% of workers in this field report being self-employed, compared to 15% of the workforce overall. There is a very low level of part-time workers in this group as well, with only about 5% of workers working part time. (In the total B.C. workforce, about 26% of workers work part time.) The unemployment rate among adjusters and claims examiners is lower than the average for all occupations. There are no general conditions that would cause this work to be seasonal, though motor vehicle claims tend to increase workloads in bad winter weather.

Insurance adjusters and *claims examiners* are employed almost exclusively in the insurance industry (about 87%). This would also include independent adjustment firms. A few workers (3%) are employed by the rail industry, and the balance work across several other industries, including some government employment, business services and retail.

Workers in this field are quite concentrated in the Lower Mainland region because the work is often in larger offices. About 77% of the province's adjusters and examiners work in the Lower Mainland, compared to 57% of the total workforce. Of the rest, 11% work on Vancouver Island, 6% in the Okanagan/Kootenay region and 5% in Northern B.C.

There is almost an even split between the men and women in this occupational group, with women making up 49% of the workers. There are very few (2%) workers under 25 years of age, compared to 15% for all occupations, and a large proportion (73%) of workers in this group are aged 25 to 44. (In the B.C. workforce as a whole, 53% are in this age group.) Experienced examiners may stay in the field for much of their career, but adjusters tend to be people at the start of their career. The average age in this occupation is 39.

Employment Prospects

This is a medium-sized occupational group, made up of 3,040 workers in B.C. in 1998. Projections from the Canadian Occupation Projection System (COPS) call for a growth rate of 1.9%, faster than average for all occupations. Between 1998 and 2008 this will result in 1,110 employment openings. Most of these openings (57%) are projected to result from growth in the number of new jobs, and the rest will result from replacing retiring workers.

Several factors could act to reduce the employment growth rate of this occupational group below the COPS forecasted rate. The main employer of this group, the finance, insurance and real estate industry, which typically employs about 87% of these professionals, is experiencing sluggish growth. In addition, this is a field where advances in technology (for example, computerized records and electronic communications) allow workers to be more productive. This increased productivity will weaken the demand for these professionals because fewer will be needed to complete the same amount of work.

In 1995 just over 82% of all *insurance adjusters* and *claims examiners* in the province worked full time, year round. Employment for this occupational group is only moderately sensitive to overall economic conditions, and seasonal employment is extremely rare. Despite this stable history, industry sources expect both part-time work and self-employment to become more common in the future. Advanced communications technology, computer software and databases allow working at home and "telecommuting" to be a reasonable option for workers in these occupations. (Telecommuting means workers work at home but regularly connect with their offices via telephone, faxes, e-mail and Internet.)

These professionals work increasingly with computerized accounting and insurance processing systems. Specialized computer skills in these areas are important, if not essential, for landing a job in this field.

Companies looking to hire adjusters sometimes recruit directly from colleges and universities. Interested job-seekers currently taking post secondary training should check with student placement offices at their college or university.

Because the level of responsibility and authority can vary, these are jobs that can change as the worker gains experience. Additional training is available on a part-time basis to upgrade qualifications. It is also possible to move up to management positions with experience, although there is stiff competition for promotions.

Additional Information

Insurance Institute of Canada http://iic.lasso.net

Related Occupations

- finance and insurance clerks (143)
- other financial officers (1114)

Insurance Underwriters

NOC 1234

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	620	780	950

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
170	120	290

Annual Growth 1998-2008 2.0%

Main Industries of Employment

Finance, Insurance, and Real Estate	93%
Provincial and Territorial Administration	5%
Local and Other Administration	1%

Employment by Region

Lower Mainland	82%
Vancouver Island	6%
Northern B.C.	2%
Okanagan/Kootenay	11%

Self-employment 4%

Nature of the Work

Insurance underwriters review and evaluate insurance applications to work out insurance risks, insurance premiums and extent of insurance coverage according to company policies. (To "underwrite" means to agree to accept liability or responsibility for possible losses by clients.) Insurance underwriters are employed at head and branch offices of insurance companies. This is a very small occupational group in this province.

Main Duties

Underwriters are experts in the risks and costs of insurance. They review individual and group applications for various types of insurance, including automobile, fire, health, liability, life, property, marine, aircraft, and so on. They use medical reports, rate tables and other reference materials to calculate risks, and evaluate new applications and renewals to work out the amount of premiums, the extent of coverage and other conditions of the insurance contract. Much of this work is done with computers, using specialized software and databases.

Underwriters also approve sales of insurance policies and make sure that government regulations are followed, and they make recommendations on individual or group insurance plan designs. They provide underwriting advice and answer inquiries from clients and from insurance agents, consultants and other company personnel. As well, they prepare underwriting reports.

©Stone/Vancouver

Example Titles

- commercial underwriter
- insurance underwriter
- marine underwriter
- property underwriter
- underwriting account representative
- underwriting service representative

Education and Training

There are various ways to become an *insurance underwriter*. One way is to start as a filing clerk or messenger and advance from there. Another approach is to obtain a diploma or degree in business or commerce and enter as a junior underwriter. Some employers prefer to hire people who have education and experience in some other type of business. For example, companies that specialize in a particular type of insurance may only select applicants with an appropriate technical background. Summer employment with an insurance company, an agency or an adjuster's office is an ideal way of determining if the general insurance industry has appeal. Regardless of the approach used to enter the industry, insurance underwriters require several years of on-the-job training.

The Insurance Institute of Canada (IIC) offers a formal training program that is recommended for career development and may be mandatory in some companies. Completion of these educational courses entitles an insurance underwriter to professional recognition as an Associate of the Insurance Institute of Canada (AIIC) and later a Fellow of the Insurance Institute of Canada (FIIC). AIIC is recognized as the hallmark of the insurance professional, and the designation is not awarded until a student has been employed for at least one full year in the insurance industry.

Business certificate and diploma programs are available at all B.C. public colleges and university colleges. These programs prepare graduates for entry-level positions in both public and private enterprises.

Undergraduate programs in business administration and commerce are available at most public universities and university colleges in B.C. Various concentrations or options are available within these programs, including accounting, finance, international business, marketing, policy analysis and human resource management. As well, the British Columbia Institute of Technology and Open University offer bachelor's degrees in business administration. Admission to college and undergraduate university programs generally requires graduation from secondary school, with a strong background in mathematics, business and English.

Master's degrees in business administration are available from most B.C. universities.

Underwriters must be detail-oriented, logical, analytical, objective and able to make intelligent decisions using sound judgement and reason. A well-rounded academic background is more useful than a narrow specialty, and English courses are important for good communication skills. Underwriters need curiosity, a genuine interest in individual client needs and a high level of personal integrity.

Working Conditions

People in this occupational group work for insurance companies, usually in a standard office setting, working "9-to-5" hours. Some evening or weekend hours may be required, depending on specific workloads and the structure of the company. The level of responsibility and difficulty of the work varies. At an entry-level job, an underwriter will work mainly with "personal" lines (for example, life insurance) calculating well-researched risks. A more senior underwriter may work on unique situations, such as the risks associated with a specific manufacturing plant.

Workers in this group have above-average earnings according to 1995 salary figures. This situation is mainly due to the small number of part-time positions. All workers, including those who worked part time or part year, earned on average $34,700, compared to the all-occupation provincial average of $27,900 However, workers employed full time for the whole year earned $38,000, compared to the provincial average of $39,400.

This is a very small occupational group. In 1998 there were 780 people working as insurance underwriters in B.C., up from 620 in 1990. Self-employment among this group is possible, but experienced underwriters are more likely to become self-employed in more general occupations such as insurance agents or brokers. It is not normally possible to start out in this field as a self-employed person. On-the-job training, or an informal apprenticeship period, is essential. About 4% of underwriters report being self-employed, compared to 15% of the workforce overall.

There is a very low level of part-time work in this group, with only about 5% of workers working part time, compared to an average of 26% in the overall workforce. The unemployment rate among underwriters is lower than the average for all occupations. There are no general conditions that would cause this work to be seasonal.

Jobs for *underwriters* are found almost exclusively (93%) in the insurance industry. A few workers are also employed in the provincial government. Workers in this field are concentrated in the Lower Mainland region because the work is often in larger offices. About 82% of the province's underwriters work in the Lower Mainland, compared to 57% of the total workforce. Of the rest, 6% live on Vancouver Island, 11% in the Okanagan/Kootenay region and 2% in Northern B.C.

About two-thirds (65%) of underwriters are women. Their representation in this occupation is much higher than it is in the workforce in general. Compared to other occupations, workers in this field are about average in age. There are slightly fewer workers in the under-25 category than average, but slightly more in the 35 to 44 group. The average age of underwriters in B.C. is 40. Interestingly, women in the field are significantly younger than their male co-workers, with an average age of 38 for women and 43 for men. In fact, 66% of the women are between 25 and 44 years old, compared to 47% for the men.

In recent years, companies are more likely to recruit young people directly into junior underwriting positions, if they have good computer skills and a proven ability to work well with other people.

Employment Prospects

This is a very small occupational group, made up of only 780 workers in B.C. in 1998. Projections from the Canadian Occupation Projection System (COPS) call for a growth rate of 2.0%, faster than average for all occupations. As it is such a small occupational group, despite high growth between 1998 and 2008, only 290 employment openings will become available. Most of these openings will result from growth in the number of new jobs (59%). The remainder will result from the replacement of retired workers.

There are a number of factors that contribute to the growth in employment of *insurance underwriters*. As people continue to increase their assets (for example, cottages, cars and other valuables) and the population itself continues to grow, so do concerns for financial security. As a result, the demand to insure these assets as well as the demand for health and life insurance also continues to grow. New or expanding businesses need to insure new factories and equipment. They also need insurance for increased product liability, workers' compensation and employee benefits.

Several factors could act to reduce the employment growth rate of this occupational group below the COPS forecasted rate. The main employer of this occupational group, the finance, insurance and real estate industry, which typically employs around 93% of these professionals, is experiencing sluggish employment growth. This is also a field where advances in technology (for example, computerized records and electronic communications) are making workers more productive. This increased productivity will weaken the demand for these professionals as fewer workers will be needed to complete the same amount of work.

The revolution in computers that has enabled these professionals to do their work far more efficiently than in the past has made good computer skills a necessity for these professionals. In order to compete with other potential job candidates, those seeking careers in this field must be adaptable to the introduction of new computer-based methods.

Once these professionals complete a period of on-the-job training and general underwriting (often about five years), most underwriters choose a specialty area, such as marine, or boiler and machinery underwriting. Or they may choose to move into management areas, either in underwriting or in the insurance firm in general. This usually requires the completion of specialized training courses offered by the Insurance Institute of Canada.

Additional Information

Insurance Institute of Canada http://iic.lasso.net

Related Occupations

- finance and insurance clerks (143)
- insurance agents and brokers (6231)
- insurance adjusters and claims examiners (1233)
- other financial officers (1114)
- insurance managers (in 01/09 middle and other management)

> ***The revolution in computers that has enabled these professionals to do their work far more efficiently than in the past has made good computer skills a necessity for these professionals.***

Assessors, Valuators and Appraisers

NOC 1235

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	1,250	1,600	1,900

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
300	250	550

Annual Growth 1998-2008	1.7%
Main Industries of Employment	
Finance, Insurance, and Real Estate	50%
Provincial and Territorial Administration	30%
Other Business Services	10%
Employment by Region	
Lower Mainland	57%
Vancouver Island	18%
Northern B.C.	10%
Okanagan/Kootenay	15%
Self-employment	24%

Nature of the Work

Assessors, *valuators* and *appraisers* estimate the value of land, improvements, businesses and other real property so that these things can be fairly sold, bought or taxed. Assessors usually value property for tax purposes. Appraisers may also specialize in various types of personal and household items. Assessors, valuators and appraisers work for government agencies, real estate and other private sector companies, or they may be self-employed.

Main Duties

Generally, *assessors, valuators* and *appraisers* have the same goal, which is to determine the value of different sorts of property. The differences in their work are usually determined by the types of things they assess. They may specialize in valuing residences, businesses or equipment, or they may specialize in valuing specific types of articles, such as antiques.

All of these workers have the following duties in common. They appraise the value of property, buildings, industrial and commercial machinery and equipment, or personal and household items, depending on the specialty of the worker. They prepare appraisal reports for lenders, insurance companies, government departments, attorneys, creditors, buyers or auctioneers. They also prepare reports for estate planning, marital settlements, insurance and business losses. They sometimes appear as expert witnesses before courts, security regulators and other regulatory boards and commissions.

Those who work with *real estate* or land have some particular duties. They assess the value of land, buildings, structures, machinery, equipment and property improvements either before these things are bought or sold, or for taxation, regional planning and grants. To determine a property's value, they must review and analyse information, such as past sales, title searches, engineering and alignment maps, soil maps, subdivision plans, and water and sewer plans.

Those who work at valuing *businesses* have to decide the value of the business's assets (including real estate) as well as how strong and successful the business is. To do this, they collect and analyse the financial records of a business, such as financial statements, budgets, projections and sales data, to estimate its market value.

Assessors, who work mainly in setting tax amounts, must value and assess in their specialty (residences, businesses, etc.), as do others in this group, and they also must explain the assessment process to taxpayers.

Example Titles

- antique appraiser
- appraiser
- art appraiser
- assessor
- business valuator
- furniture appraiser
- property assessor
- property valuator
- real estate appraiser
- valuator

Education and Training

Individuals can become *professional appraisers* by qualifying for the designations Canadian Residential Appraiser (CRA) and Accredited Appraiser Canadian Institute (AACI). They must first become members of the Appraisal Institute of Canada (AIC) and then complete course work, attend seminars, complete an articling assignment and pass an oral interview and written examination. The AACI designation is more comprehensive than the CRA designation and also requires completion of a demonstration appraisal report. To receive the CRA designation takes approximately three to four years, and the AACI designation takes about five to seven years, depending on how long a student takes to complete the educational requirements.

The University of British Columbia (UBC) and Langara College offer educational programs that allow graduates to challenge the national examination with the Appraisal Institute of Canada and then proceed toward the AACI designations. UBC offers a four-year correspondence diploma program in urban land economics and Langara College offers a Real Estate Studies Diploma program. The Real Estate Studies Diploma program is a full-time, two-year diploma program, with an optional cooperative education component. Langara College also offers a part-time Real Estate Studies Certificate - Appraisal program, and Okanagan University College has a Real Estate Appraisal program that includes core courses required for the AIC designations.

Real estate salespeople can become real estate appraisers by completing a Market Value Appraiser (residential) program offered through UBC, followed by five years of practice in the industry. See the profile Real Estate Agents and Salespersons (6232) for details.

The British Columbia Assessment Authority (BCAA), a crown corporation, is responsible for all municipal assessments within the province. There are three levels of appraisers at BCAA. These are, Trainee, Appraiser 1 and Appraiser 2. Upon recruitment, trainees must be enrolled in or currently taking appraiser-related courses. For example, UBC offers a two-year correspondence program in real property assessment through the Faculty of Commerce and Business. By the time trainees achieve Appraiser 2 status they have met the basic requirements for the AACI designation.

Appraisers and assessors need good observational skills, decision-making skills and excellent oral and written communication skills. They require initiative and need to be analytical and prepared to upgrade their training and skills continually.

Working Conditions

The majority of workers in this group work out of offices but spend a lot of their time in the field examining and researching the things to be assessed. After-hours or weekend work may be required, and property appraisers especially often will work outside. Seasonal work isn't common, though assessors are usually especially busy in the spring and summer.

The great majority of workers in this group are employed in real estate and finance. The few who work at other specialties, such as personal or household goods, tend to combine this with retail sales of some sort. For example, jewellery and antique shops often offer an appraisal service but usually have a staff member skilled in appraisals who also does other things, such as sales or auctions.

Workers in these occupations have above-average earnings, according to 1995 salary figures. All workers, including those who worked part time or part year, earned on average $37,300, compared to the all-occupation provincial average of $27,900. Workers employed full time for the full year earned $43,300, compared to the provincial average of $39,400. Industry sources suggest a well-qualified and experienced appraiser can earn up to $70,000 per year.

Recent college graduates who found work in this occupational group reported an average monthly salary of $3,190. For those who work for the full year, that will mean an annual starting salary of about $38,280.

In 1998 there were 1,600 people in this occupational group in B.C., up from 1,250 in 1990. There is a high rate of self-employment in this group, as many appraisers work independently. In 1995, 24% of workers in this group reported being self-employed, compared to 15% of the workforce overall.

There is a low level of part-time work in these occupations, with only about 11% of workers working part time, compared to 26% in the labour force as a whole. The unemployment rate among assessors, valuators and appraisers is lower than the average for all occupations. These workers are highly skilled and knowledgeable about their specialty and therefore have good prospects for steady work.

Assessors, valuators and *appraisers* are employed mainly by real estate companies and financial organizations (50%) and by various levels of government (38%). A few are employed in business services and other industries where assessment and valuation would be necessary, such as the wholesale trade.

Geographically, the distribution of workers around the province almost exactly matches the average for all occupations. There are 57% of the workers in the Lower Mainland, 18% on Vancouver Island, 15% in the Okanagan/Kootenay region and 10% in Northern B.C.

A large majority of assessors, valuators and appraisers are men. Only about 20% of workers in this occupational group are women. Compared to other occupations, there are more people in the mature portion of their working lives in this field than average. About 45% are between 45 and 64 years of age, compared to only 30% of the workforce in total. There are also fewer than average young people doing this work. The average age is 43.

Employment Prospects

This is a small occupational group, made up of 1,600 workers in B.C. in 1998. Projections from the Canadian Occupation Projection System (COPS) call for a growth rate of 1.7%, about as fast as the average for all occupations. According to this projection, 550 openings will become available between 1998 and 2008. A little over half of these openings (55%) will result from growth in the number of new jobs. The rest will come from the replacement of retired workers. Employment growth for many of these occupations is closely linked to that of the construction industry, which is also experiencing an average rate of growth. These workers are not usually employed in this industry, but it does require their services.

Several factors could act to reduce the employment growth rate of this occupational group below the COPS forecasted rate. The main employer of this occupational group, the finance, insurance and real estate industry, which typically employs about half of these professionals, is experiencing sluggish growth. According to industry sources, this is a field where advances in technology are making workers more productive, and fewer are needed to complete the same amount of work. This increased productivity could reduce the employment growth rate. Appraisers provide a good example of increased productivity due to new technology. Appraisers have improved access to a variety of electronic databases required to complete their work. The introduction of specialized computer software programs requires less input from appraisers to complete property assessments. These factors have greatly reduced the length of time needed to do a residential appraisal.

Generally, this is a job that requires training followed by obtaining related experience. Professional credentials, such as CRA and AACI, are associated with higher salaries and further promotion. Progression to management positions in each field is possible with experience. Experienced appraisers often move into related fields, such as real estate investment analysis.

Workers are sometimes hired through recruitment at training institutions as well as through ads in newspapers and the Appraisal Association's newsletter. With experience, progression from these positions to supervisory positions is possible.

Additional Information

B.C. Association of the Appraisal Institute of Canada
http://www.appraisal.bc.ca

Related Occupations

- property administrators (1224)
- insurance adjusters and claims examiners (1233)
- real estate salespersons and agents (6232)
- market analyst (in 416 policy and program officers, researchers and consultants)
- financial auditors and accountants (1111)
- financial and investment analysts (1112)
- retail trade managers (in 01/09 middle and other management)

Customs, Ship and Other Brokers

NOC 1236

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	560	740	980

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
240	120	360

Annual Growth 1998-2008 2.8%

Main Industries of Employment

Other Business Services	60%
Water Transportation	12%
Postal and Courier Services	9%

Employment by Region

Lower Mainland	88%
Vancouver Island	3%
Northern B.C.	2%
Okanagan/Kootenay	5%

Self-employment 7%

Nature of the Work

Customs brokers clear goods through customs and to their destination for importer and exporter clients. *Ship brokers* buy and sell ships, yachts and cargo space on ships for clients. These workers are employed by customs, ship or other brokerage establishments, or they may be self-employed. This group also includes other brokers not elsewhere classified, who negotiate commercial transactions or other services between parties on behalf of clients. Only 740 people were employed in this category in the province in 1998, so it is a very small occupational group.

Main Duties

Customs brokers work in importing and exporting all kinds of goods. They prepare and process import/export documents and other forms for clients, according to customs regulations, laws and procedures. They arrange for the payment of fees associated with transporting, storing and importing goods. They also provide advice to clients on export and import restrictions, tariff systems, letters of credit, insurance requirements and other customs-related matters. In some cases they may represent clients before administrative tribunals or in other dealings with government officials. Most customs brokers use computerized information management systems. They also use on-line computer networks, such as the Internet, to communicate and gather information.

Ship brokers help their clients move goods by water transport. To do this, they buy and sell cargo space on ships on behalf of individuals, companies and governments. They consult trade publications and other sources, including electronic sources, to provide information to clients on available cargo space, destinations, rates and departures. They also negotiate rates and terms for shipping and prepare contracts and other papers.

Ship brokers also buy and sell ships and yachts on behalf of clients. In this process, they inspect vessels, explain features and negotiate prices. They also arrange for insurance coverage for cargo or for ships and arrange for the registration and licensing of ships. Most of the opportunities in B.C. are for customs brokers. Ship brokers are a much smaller group and often combine this work with other duties, such as recreational equipment sales or general administrative services.

Other types of brokers will sell or purchase goods or services. They will oversee these transactions and work on their clients' behalf, whether in selling or purchasing.

Example Titles

- cargo broker
- chartered ship broker
- customs broker
- gas broker
- licensed customs broker
- ship broker

Education and Training

Becoming a *customs broker* requires completion of grade 12, then successful completion of the Canadian Society of Custom Brokers (CSCB) Qualification Course. This is a two-year correspondence course provided by the CSCB that prepares students for writing the Custom Brokers Qualifying Examination. Although registration in the course is open to the general public, the vast majority of students are employees of brokerage firms.

A customs broker requires a licence to operate a customs brokerage business. Individuals must pass the Customs Broker Professional Examination delivered through Canada Customs and Revenue Agency to receive a licence.

Post secondary education in business administration, commerce or a related field may be helpful in securing employment. The British Columbia Institute of Technology offers a two-year International Trade and Transportation Business diploma program. Graduates receive broad training in the fundamentals of business and their application to trade and transport. Admission requires grade 12, and basic computer and keyboard skills are recommended since there is extensive use of computers in the program.

Another relevant program is the Traffic, Customs and Transportation Certificate offered at Vancouver Community College. This nine-month program prepares students for entry-level employment in the transportation or customs industry. Students study transportation systems and how they relate to international trade and the economy of Canada. Admission requirements include grade 12, with basic keyboard skills.

In addition to course work, several years of on-the-job training are required.

Comfort with computers and knowledge of electronic communication networks is important in this profession. Good language and interpersonal skills are needed as well as an attention to detail and an ability to organize.

Working Conditions

Workers in this occupational group tend to work in a standard office setting. Regular office hours are the rule, though some after-hours or weekend work may be required, depending on specific demands. Ship brokers will spend part of their time out of the office, inspecting yachts or ships.

According to 1995 salary figures, workers employed full time for the full year earned $37,700, compared to the provincial average of $39,400. Industry sources estimate an average starting salary of $13,000 to $18,000 a year. The range of possible earnings for qualified, well experienced workers is quite large. Earnings were estimated by current brokers to be between $26,000 and $60,000 per year.

In 1998, there were 740 people in this occupational group in B.C., up from 560 in 1990. Self-employment is possible, as brokers may work as independent consultants for a base of clients. Approximately 7% of workers in this group report being self-employed, compared to 15% of the workforce overall.

There is a very low level of part-time workers in this occupational group, with only about 2% of workers working part time, compared to the all-occupation average of 26%. The unemployment rate among customs and ship brokers is lower than the average for all occupations. There are no general conditions that would cause this work to be seasonal.

Customs and ship brokers are employed mainly in the business services industry, which includes customs brokerage firms and management consulting services. This area provides work for about 60% of those employed as customs and ship brokers. The second largest employer is the water transport industry (for example, marine freight transport, cargo handling), which employs 12% of the workers. The rest are employed in industries that require goods to be moved, such as courier services, other transportation and wholesale trades.

Because the work of these brokers is centred around ocean ports and border points, about 90% work in the Lower Mainland. Another 3% work on Vancouver Island, with the regions of the Okanagan/Kootenay and Northern B.C. sharing the remaining 7% of workers. There is an even split between the men and women in this occupation (women represent 50% of the workers). Customs and ship brokers are slightly younger than average (62% of the workers are between 25 and 44 years old, compared to 53% for the workforce in total). The average age is 37.

Employment Prospects

This is a very small occupational group, estimated at only 740 workers in B.C. in 1998. Projections from the Canadian Occupational Projection System (COPS) call for much faster than average growth. Between 1998 and 2008 it is expected that there will be about 240 new jobs and 120 replacement jobs, for a total of 360 openings province-wide in this field. Within this occupational group, ship brokers will experience the highest growth in employment.

Although industry sources believe that employment growth for this occupational group will be above average, they think the COPS projection is too optimistic. Although new positions are being created as trade grows, increased efficiencies brought about through automation and electronic communications allow some companies to avoid replacing staff who retire or leave the business.

The work in this field is being changed constantly, and brokers need to be able to offer their customers a high level of service, using the most up-to-date knowledge and tools. New methods allow brokers to be more productive and to respond to market conditions faster.

According to industry sources, finding qualified workers to fill openings in this field is difficult. However, as it is more common to hire internally, those who are attempting to enter this field may have to do so through related entry-level positions. Customs brokerage firms regularly train and promote existing staff and allow them to perform brokerage work once they're qualified. When business lags, these workers will often be retained as staff, but go back to doing clerical work. These jobs are often advertised in newspapers.

There is little mobility between the different types of brokers in this group (for example, ship, customs and gas). Professional credentials (which can be earned part time) and experience can help workers earn better salaries and fees. Credentials and experience will also help workers advance to management or to running their own brokerage firms.

Additional Information

Canadian Society of Customs Brokers http://www.cscb.ca

Related Occupations

- revenue (customs) officer (in 1228 immigration, employment insurance and revenue officers)
- insurance broker (in 6231 insurance agents and brokers)
- securities agents, investment advisors and investment representatives (1113)
- financial brokerage managers (in 01/09 middle and other management)

Secretaries, Recorders and Transcriptionists

NOC 124

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	43,570	35,450	36,390

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
940	5,770	6,710

Annual Growth 1998-2008	0.3%

Main Industries of Employment

Professional Business Services	16%
Education	13%
Physicians, and Health Practitioners and Medical Labs	11%

Employment by Region

Lower Mainland	61%
Vancouver Island	17%
Northern B.C.	8%
Okanagan/Kootenay	14%

Self-employment	8%

Nature of the Work

Secretaries perform a variety of administrative duties in support of managerial and professional employers. They are employed in offices throughout the public and private sectors.

This very large occupational group also contains specialized secretaries and other recorders of information. *Legal secretaries* perform secretarial and administrative duties in law offices, legal departments of large firms, real estate companies, public courts and government. *Medical secretaries* (medical office assistants) perform a variety of secretarial and administrative duties in doctors' offices, hospitals, medical clinics and other medical settings.

Court reporters record and transcribe verbatim proceedings of courts, legislative assemblies and committees, and prepare dictated reports, correspondence and statistics. They are employed by courts of law, the provincial legislative assembly and committees, lawyers and the legal community, or they may be self-employed or on contract to these bodies.

Medical transcriptionists record and transcribe surgical proceedings, medical records and other reports requiring knowledge of medical terminology. They are employed by hospitals, medical clinics and doctors' offices, or they may be self-employed. (To transcribe means to put in written form.)

Main Duties

Secretaries, including those who work in medical and legal settings, have some common duties. They type correspondence, reports, invoices and related material from handwritten copy or machine dictation, using a computer, word processor or, less commonly, a typewriter. Increasingly, they use word-processing or desktop publishing software to format text drafted by others, rather than working from handwritten copies. This may include the preparation of presentation materials. They also prepare routine correspondence and compile data, statistics and other information. Some secretaries assist committees by taking minutes. Minute-taking routinely uses laptop computers or tape-recordings. In most cases shorthand is no longer used.

Secretaries are also responsible for information management. They make sure information gets to the people who need it, and they store and organize information so that it can be found easily. This means they open and distribute incoming mail and other material, and they may use an electronic mail system. They may be required to do information searches using the Internet or other electronic means. They answer telephone inquiries and relay telephone calls, and they set up and maintain filing systems.

Other common duties include scheduling and confirming their employer's appointments and meetings, and greeting visitors and directing them to the appropriate person. They may handle routine invoicing and payments and order office supplies, and they may supervise other office workers.

Legal secretaries have some duties that differ from their co-workers. These specialized duties require an understanding of the vocabulary and processes of law. They handle and format legal correspondence such as deeds, wills, affidavits and briefs. They also review and proofread outgoing documents and correspondence to make sure that the documents agree with legal procedures and grammatical usage. In some cases they attend court or meetings to take notes or minutes.

The duties of *medical secretaries* also include specialized tasks. They schedule and confirm medical appointments and deliver messages between doctors and patients, type medical records and reports from handwritten notes, and interview patients to complete forms and case histories. They also make sure doctors get paid, by completing insurance and other claim forms and handling billing procedures. They may order medical supplies as well as regular office supplies. It should be noted that medical secretaries are very often referred to as medical office assistants, and related training programs in this province may also use that title.

The jobs of *medical transcriptionists* and *court reporters* are focused specifically on recording and transferring information in a very exact way. Their work has fewer general clerical duties than does the work of secretaries, although in some cases, they may be required to perform some administrative tasks. *Court reporters* record verbatim (word-for-word) proceedings of the courtroom using a stenography machine, computerized recording equipment or a stenomask (a dictation device). They read back notes during a trial on request and transcribe recorded proceedings in keeping with set formats. Because absolute accuracy is essential, they also check transcripts by reviewing the copy against the original record of proceedings, and they research and locate quotes.

Medical transcriptionists mainly transcribe machine dictation or rough notes from medical reports, correspondence, medical records and patient information. They also must be able to proofread work for typographical and grammatical errors to make sure that it is completely accurate. In some cases they may take on administrative responsibilities in clinics, such as completing insurance and other claim forms.

©Stone/Vancouver

Example Titles

general secretary (1241):
- executive secretary
- general secretary
- technical secretary

legal secretary (1242):
- estate secretary
- legal secretary
- litigation secretary
- real estate secretary

medical secretary (1243):
- medical secretary
- ward secretary
- medical office assistant

court recorders and medical transcriptionists (1244):
- court recorder
- court reporter
- court stenographer
- hansard court reporter
- medical transcriptionist
- transcriptionist

Education and Training

High school graduation, with courses in business, is the minimum requirement for *secretaries*, but most employers prefer to hire those with college training in office administration and related areas.

Most B.C. colleges and university colleges offer programs that teach basic office skills/office administration. These programs train students in areas such as typing, reception, office systems and word processing. Admission requirements vary, and program lengths also vary from a few months up to about a year. For those seeking promotion, advanced courses in office management and business administration are recommended.

Camosun College, College of the Rockies, Douglas College, Northern Lights College and Selkirk College have diploma programs in office management for those interested in supervisory positions. Admission requirements vary, but usually grade 12 English and grade 10 mathematics are required. Upgrading programs are available at all public colleges and university colleges.

Secretarial education is offered at a variety of business colleges throughout the province. The International Association of Administrative Professionals provides a Certified Professional Secretary rating that includes educational and employment experience requirements and examination.

Employment as a *legal secretary* normally requires some specialized training. Certificate programs for legal secretaries are offered at most colleges and university colleges. Admission requirements vary, but usually a grade 12 diploma or equivalent is required as well as demonstrated English proficiency and keyboard skills. To be successful, legal secretaries require keyboard skills of 70 wpm, excellent computer skills, a strong command of English and good interpersonal and organizational skills. To stay current in the field, continuing education about legal theory and continued training in computer skills (including new software) are required. (Legal secretaries may become legal assistants following on-the-job training or by taking evening courses in theory and practice.)

Medical office assistants usually require completion of secondary school and specialized training. Relevant certificate programs are available at Camosun College, Capilano College, Douglas College, Vancouver Community College and most university colleges. Admission requirements vary, but generally grade 12 or equivalent and 35 wpm keyboard speed are required. *Medical secretaries* must have an effective command of English, strong interpersonal skills and flexibility. In order to remain competitive, they must keep informed about new medical billing procedures and computer applications.

Medical transcriptionists and *court recorders* usually require completion of grade 12 and a college program in medical transcription or court reporting. Vancouver Community College offers a nine-month Medical Transcriptionist program that emphasizes written communication skills using specialized terminology and transcription relating to reports, such as history and physical consultation, radiology, laboratory, oncology, surgery, pathology and discharge summaries. The program includes a practicum to provide students with on-the-job experience. Admission requires grade 12 or equivalent, one year of related office experience and typing speed of 25 wpm. Selkirk College also offers comprehensive courses in medical terminology and transcription ranging from an Introduction to Medical Terminology course to an Advanced Medical Transcription program.

Langara College offers prospective *court reporters* a Realtime Reporting/Court Reporting Program. Students have the option of completing a Stenoscription Certificate, Court Reporting Diploma, Realtime Reporting Post-Diploma Certificate or all of the above. Applicants must have grade 12, be proficient at touch typing, have unimpaired hearing, speech and vision, and have good manual dexterity and physical stamina. In addition, students must be mature and emotionally stable in order to deal with a variety of people in sometimes distressing circumstances. Acceptance is determined by pre-admission tests given by the college.

Computer use has produced a demand for secretaries who can adapt to technological and system changes. This requires a desire to learn how to operate new equipment and apply new software and includes use of the Internet. Technological change often affects the administrative system, and secretaries of all specialties must remain informed about new approaches. Comfort working with numbers and excellent keyboard skills are usually required. Communication skills, a strong command of English, flexibility and adaptability are required. Organizational and general administrative skills and basic analytical skills are also necessary. Being able to work as a member of a team is important.

Working Conditions

Secretaries work in a wide range of office settings. Normal hours of work are standard office hours, though some after-hours or weekend work may be required, depending on specific demands. The work requires extensive use of computerized word processing and information management systems and equipment. Most workers in this occupational grouping are general secretaries (75%).

Legal secretaries work mainly in law offices, or they may work in the legal section of a larger organization. They are required to have an understanding of legal terminology and of common legal documents.

Medical secretaries usually work in the offices of physicians, dentists or other medical practitioners and will find their hours set by their employers' clinic hours. Those who work in hospitals as ward secretaries may occasionally be on a shift system.

Medical transcriptionists primarily work in clinics or hospital records sections. Both medical secretaries and medical transcriptionists are required to have extensive knowledge of medical terminology. *Court reporters* will work in public courthouses and legislative assemblies during the hours of the sessions, although transcription of notes and formatting of transcripts may take place outside these premises and hours. Like legal secretaries, they are required to have an understanding of legal terminology and processes.

Earnings for all workers in this entire occupational grouping are below the provincial average, according to 1995 salary figures. All workers, including those who worked part time or part year, earned on average $23,200, compared to the all-occupation average of $27,900. Workers employed in this occupational group full time for the full year earned $29,500, compared to the provincial average of $39,400. Experienced, well-trained workers can usually expect to earn above the average.

Medical secretaries have the lowest wages, with a 1995 annual full-time, full-year wage of $28,900. For full-time, full-year work, general secretaries earned an average of $29,400, and legal secretaries earned a little more at $30,100. Reporters and transcriptionists had the highest average wage, at $33,400 for a full-time, full-year job. Information from the Lower Mainland for the end of 1995 showed a range of hourly wages for non-union secretaries from $10 to $19 an hour. Union positions paid $13 to $21 an hour. Similar information in Northern B.C. put the average non-union wage at about $11 an hour, and union wages are higher.

On average, recent college graduates who found work in this occupational category reported a monthly salary of $1,900. For those who work for the full year, that will mean an annual starting salary of about $22,800. Within this group, reporters and transcriptionists earned the most ($2,650 per month), followed by legal secretaries ($1,910) and medical secretaries ($1,880). General secretaries received the least ($1,810).

In 1998 there were 35,450 people in this occupational group, down from 43,570 in 1990. Most of these workers (72%) were general secretaries. Of the remainder, 13% were legal secretaries, 12% were medical secretaries, and 2% worked as transcriptionists and court reporters.

At about 8%, self-employment among this group is less common than average, although flexible work arrangements provided by "temping" or working for placement agencies are becoming more common. ("Temping" means working for an agency that provides workers with short-term or temporary placements in a variety of client companies.) Industry sources suggest flexible work arrangements, such as self-employment and contracting, are becoming more common, especially among medical secretaries.

Court reporters have the strongest opportunities for self-employment. The group of court reporters and transcriptionists report 23% self-employment, well above the provincial average of 15%. Court reporters often increase their income by selling transcripts (for example, to legal associations) or by taking on extra formatting work. Many court reporters who are self-employed make the bulk of their income by producing transcripts for lawyers. At one time all court reporters working for the provincial government were self-employed and hired under contract. But as of 1996 all court reporters who work for the provincial government are hired on a part-time permanent basis.

There is also a high proportion of part-time and/or part-year work in this occupational category overall. Just under half of the people (48%) work full time for the whole year. The best prospects for full-time, full-year work are among legal secretaries (58% work full time, full year). Court reporters and medical transcriptionists are the least likely to have a full-time job for the whole year. Only 45% of these workers report having full-time, full-year positions.

There is no all-inclusive reason for seasonal work in this group. However, general secretaries are employed in all industries and may experience seasonal layoffs or slowdowns in industries affected by seasonal factors, such as forestry or construction. The unemployment rate among this group of workers is lower than the average for all occupations. Reports from employment centres say that there is a steady demand for secretaries, but there is also a good supply, so competition can be strong.

General secretaries are employed across a wide range of industries. The most significant area for employment of this group is education, which accounts for 17% of the workers. Finance, insurance and real estate together with professional business services (such as bookkeeping and accounting) employ another 17%.

Understandably, the more specialized groups within this occupational group show different employment patterns. Nearly 83% of legal secretaries are employed by the business services sector, which includes law offices. Medical secretaries are most likely to work in health practices, clinics and hospitals. Transcriptionists and court reporters are primarily employed by government, either in hospitals or by the provincial justice administration.

Employment in these occupations is more likely to be found in cities, where business service organizations are located. About 61% work in the Lower Mainland region, compared to 57% of the total workforce. This leaves a roughly average distribution of workers in the rest of the province, with 17% on Vancouver Island, 14% in the Okanagan/Kootenay region and 8% in Northern B.C.

At 98% this group of workers is almost entirely female. Compared to other occupations, the age distribution is fairly typical, though there are fewer than average in the youngest group (those workers less than 25 years old). The average age is 41. Legal secretaries are the youngest of the sub-groups, with an average age of 37.

Employment Prospects

This is a very large occupational group, made up of about 35,450 workers in B.C. in 1998. The Canadian Occupation Projection System (COPS) projects a growth rate of 0.3%, slower than the average for all occupations. Since this is such a large occupational group, there will still be a large number of employment openings. Between 1998 and 2008 it is expected that 6,710 positions will become available. Most of these openings (86%) will result from the replacement of retired workers. The rest will come from growth in the number of new jobs. Industry sources expect that there will be many additional employment openings because of a high rate of worker turnover.

There are a number of factors responsible for the low employment growth of this occupational group. Office automation has increased productivity and, at the same time, has reduced the demand for these professionals across all industries. The impact of computerization has been accompanied by a general trend of downsizing. Clerical and administrative staffs have often been the target of job cuts, leaving many secretaries doing a greater share of the remaining clerical work than before. The use of computers by virtually all office staff means that many offices and managers do not have enough work to justify hiring a secretary full time. As a result, it is becoming common practice to "share" secretaries.

Competition for these employment openings is expected to remain high as there are so many qualified people looking for positions in this field. Additional competition will come from those moving to the province who bring appropriate experience with them. In order to stay competitive, secretaries need to be able to adapt to changing methods and responsibilities.

There are a number of different types of secretaries and other workers within this occupational group. The majority (roughly 72%) consists of general secretaries. Legal and medical secretaries comprise 13% and 12% respectively of this occupational group. The remaining 2% consist of court reporters and transcriptionists. Employment for each of these sub-groups of workers is projected to grow more slowly than average with the exception of court reporters and transcriptionists whose numbers are projected to decline through to 2008.

Industry sources have a more positive outlook than the COPS forecast. They suggest that *medical secretaries* should experience good employment growth as the demand for medical services in general continues to increase due to an aging population. Industry sources also expect that the demand for *legal secretaries* will rise because the demand for legal services is growing in response to both population and economic growth.

The secretarial field has experienced tremendous changes in recent years. Computer use has changed the nature of the work as many executives and professionals now compose and type their own documents. This leaves less of this traditional work for secretarial staff, who may now be expected to take the word-processed product and format it using desktop publishing methods. Similarly, record keeping and other administrative tasks have been computerized, and some secretaries are expected to manipulate information to produce reports and summaries on a regular basis. Often computer use has increased the level of responsibility and complexity of the secretary's job. In some cases however, automation has left secretaries with a narrow range of duties. Familiarity with the most current version of popular software packages is essential as is the ability and willingness to upgrade those skills constantly.

Technological change is changing the work of *court reporters* and other *transcriptionists* and will continue to reduce their employment. Industry sources indicate that court proceedings are now transcribed by computerized transcription machines, which are operated by other courtroom clerks. Although this will replace the need for court reporters, the services of other transcriptionists may be required to transcribe recorded court proceedings into text documents. This is usually done through private contracting companies, which hire most transcriptionists.

Of the specialties within this group, *legal secretaries* have more favourable labour market conditions. They are well-paid relative to other secretaries and have stronger prospects for full-time work than do any others in this group. The most employable and promotable legal secretaries have specific training and experience in litigation and conveyancing procedures. In some cases legal secretaries may be recruited from the ranks of general secretaries working for an organization and trained on the job. All legal secretaries should be prepared to take on additional training in legal theory and practice to keep their prospects for employment and promotion strong.

Medical secretaries must also be well-trained in medical terminology, but unfortunately their skill is not reflected in their salaries. Though they tend to have more formal education than general secretaries, they are the lowest-paid of all groups of secretaries and are the most likely to have part-time or part-year work.

There is some mobility between the occupations of court reporters and transcriptionists. Recorders and transcriptionists may also have skills useful for closed-captioning. Legal secretaries can take further training to move into paralegal positions. Experienced and highly skilled secretaries can move into more responsible positions, such as office manager.

Secretaries can often learn about vacancies through newspaper advertisements. In a field with a strong supply of workers, word of mouth will also be a source of information about openings. Some colleges may be approached directly by employers interested in hiring their graduates.

Additional Information

International Association of Administrative Professionals
http://www.iaap-hq.org

Related Occupations

general secretaries:

- clerical occupations, general office skills (141)
- administrative support clerks (144)
- executive assistants (1222)
- office manager (in 1221 administrative officers)

legal secretaries and court reporters:

- by-law clerk (in 144 administrative support clerks)
- paralegal and related occupations (4211)

medical secretaries and medical transcriptionists:

- medical records clerk (in 141 clerical occupations, general office skills)
- ward clerk (in 144 administrative support clerks)
- dental assistants (3411)

The secretarial field has experienced tremendous changes in recent years. Computer use has changed the nature of the work as many executives and professionals now compose and type their own documents. This leaves less of this traditional work for secretarial staff, who may now be expected to take the word-processed product and format it using desktop publishing methods.

Clerical Occupations, General Office Skills

NOC 141

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	45,720	46,740	48,720

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
1,980	6,820	8,800

Annual Growth 1998-2008	0.4%
Main Industries of Employment	
Physicians, and Health Practitioners and Medical Labs	15%
Finance, Insurance, and Real Estate	9%
Hospitals	7%
Employment by Region	
Lower Mainland	62%
Vancouver Island	17%
Northern B.C.	8%
Okanagan/Kootenay	13%
Self-employment	5%

Nature of the Work

This is a very large occupational group because most businesses require clerks to ensure that records are properly kept, clients are attended to and office equipment is efficiently used. Most clerks perform general clerical duties, though some have specialized tasks or concentrate on one type of work.

General office clerks, typists, receptionists and *file clerks* are employed in offices throughout the public and private sectors. The health care sector employs many *medical clerks* who work in hospitals, clinics and other health care institutions.

Main Duties

Workers in this clerical group perform a range of duties to keep offices running smoothly. Often their titles describe their main responsibilities (for example, receptionist), but most workers will be involved to some extent in a variety of tasks.

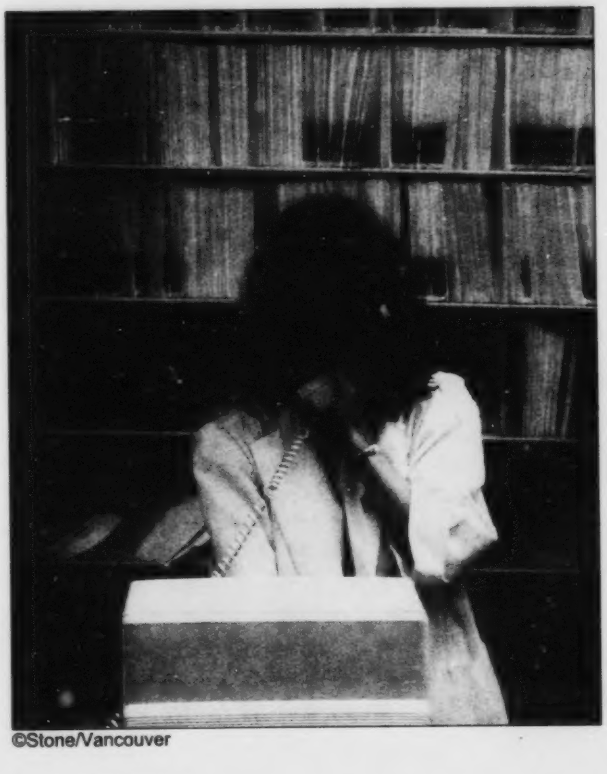
Although their work loads will vary by size and type of office, *general office clerks* or *clerk/typists* generally type correspondence, reports and other documents. They also maintain filing, inventory, mailing and database systems, provide general information to clients and the public, and maintain files and records. They may perform routine bookkeeping tasks, such as preparing invoices and bank deposits.

This type of general clerical position is by far the most common. Some employers may distinguish specialized duties for other clerical workers. Even workers with specific titles will probably be expected to do many kinds of clerical tasks, such as those described above.

Typists spend most of their time preparing documents. More frequently, typists are becoming *word processing operators*. Typewriters are rarely used, and most text processing is done using computers and word processing or desktop publishing software.

The main responsibility of *receptionists* and *switchboard operators* is to greet clients and visitors and direct them to the appropriate person or area. *Switchboard operators* mainly do this using telephone systems, whereas *receptionists* work with telephones and walk-ins.

Records and *file clerks* spend the bulk of their time sorting and filing material and then retrieving it when people need it. They also set up and maintain filing systems. Many records clerks work specifically as *medical office clerks* or *medical records clerks*. They maintain patient health records and related information and prepare medical, social and administrative statistics. They apply their knowledge of medical terminology to do the work.



©Stone/Vancouver

Example Titles

general office clerk (1411):
- administrative assistant
- hospital unit clerk
- medical office clerk

- office assistant
- office clerk

typist and word processing operator (1412):
- word processing clerk
- word processing operator

records and file clerk (1413):
- file clerk
- health records technician
- medical records clerk
- records system clerk

receptionist and switchboard operator (1414):
- answering service operator
- hospital admitting clerk
- medical receptionist
- receptionist
- switchboard operator

Education and Training

Although some employers in this field accept less than grade 12, most prefer applicants with a high school diploma and courses in English, business and computer use. Some may choose a candidate with less formal education if that person has previous office experience and related experience dealing with the public. The oversupply of qualified candidates for openings in clerical positions favours those with a higher level of education and more extensive skills, however, and these workers have a greater chance of moving into a supervisory position.

The Open Learning Agency, British Columbia Institute of Technology and all B.C. public colleges and university colleges offer programs that teach basic office skills/office administration. These programs train students in areas such as typing, reception, office systems and word processing. Admission requirements vary, and program lengths also vary from a few months up to about a year. For those seeking promotion, advanced courses in office management and business administration are recommended.

Okanagan University College, Camosun College, Vancouver Community College and the University College of the Fraser Valley offer nursing unit clerk programs for people who want to perform clerical and administrative duties in a hospital. Admission requirements generally include grade 12 plus courses in medical terminology and keyboard skills.

For those interested in work as a health records practitioner, Douglas College offers a two-year Health Information Services diploma program that includes a practicum. This program combines aspects of business, health, computer science and research in a unique records and information management program. Admission requires grade 12, submission of a written essay and personal resume, verification that the applicant toured a health record/health information services department in a health care facility and attendance at a group information session. Graduates are eligible to write the Canadian College of Health Record Administrators examination, which confers the right to work anywhere in Canada.

For details on medical receptionist occupations see the profile Secretaries, Recorders and Transcriptionists (124).

Personal qualities needed for this type of work include good organizing skills, comfort with computers and word processing equipment, and good English and communication skills. An ability to work with office systems, such as filing, and an ability to follow instructions are also important.

Working Conditions

Workers in this very large occupational group are employed in almost every kind of business and in all levels of government. They are needed to manage the paperwork and keep track of the business. They need to know how to use a variety of office machines, such as copiers, fax machines, computers and telephone switchboards.

There are many part-time and full-time jobs available, and the workers work indoors with other people. A standard 35 to 40 hour week, working regular office hours, is most common. Some evening or weekend work may be required, and those working in health care facilities sometimes work shifts.

While the introduction of new office technologies has increased overall office efficiency and individual productivity, it has also altered the nature of many clerical positions and has reduced opportunities for general office clerks. For example, filing of letters and documents more often is done now by higher-skilled secretarial staff and typists at computers than by general office clerks.

In 1995 the average earnings for these workers was $19,100. For those who were employed full time for the full year, the average income was $27,700. *Receptionists* and *switchboard operators* had the lowest average income at $24,800 for those who worked full time for the whole year. Comparable figures for *records* and *file clerks, general office clerks*, and *typists* and *word processors* were $30,800, $29,200, and $28,500 respectively. These figures are below the provincial workforce averages. Hourly wages in some cases start at minimum wage, though average wages for union positions are higher. Often experienced workers progress to higher-paying jobs in related occupations, such as secretaries and office managers.

On average, recent college graduates who found work in this occupational category reported a monthly salary of $1,660. For those who work for the full year, that will mean an annual starting salary of about $19,900. Within this group, records and file clerks earned the most ($2,060 per month), followed by typists and word processors ($1,860) and general office clerks ($1,730). Receptionists and switchboard operators received the least ($1,510).

This is a very large occupational group with about 45,720 workers in 1990. The number of people in this occupational group has remained relatively stable. By 1998 the number increased to only 46,740. The general office clerks form the largest sub-group with 49% of these workers. Receptionists and switchboard operators constitute 39%, records and file clerks constitute7%, and typists and word processors constitute 5%.

While part-time employment is relatively common in this occupational group, self-employment is not. About 35% of the workers work part time, and 5% are self-employed. Just over 40% work full time, full year. Industry sources expect that part-time and contract opportunities will increase. Many organizations have found it cost-efficient to hire people only as long as they are needed, rather than take on full-time permanent staff. Workers also have greater flexibility to choose part-time or short-term work options. The unemployment rate for clerical workers is lower than average for all occupations. Employment in this group does not vary with the season.

Clerical workers are employed across many industries, and no one industry dominates overall. At the more specific occupation level, it is worth noting that 27% of typists and word processors work in professional services and other business services, 34% of records and file clerks work in hospitals, medical labs and with health practitioners, and 40% of reception and switchboard operators also work in hospitals and medical labs and with health practitioners. About 72% of the province's clerical workers are employed in the the Lower Mainland and Victoria. The remainder are distributed proportionately throughout the province.

Women dominate this occupational group. About 91% of the workers are women. The average age of workers is 37, which is slightly lower than the average age of all workers. About 18% of them are below the age of 25. This proportion in the younger age group is somewhat higher than average and suggests that these occupations are often entry-level jobs.

Employment Prospects

This is a very large occupational group, made up of about 46,740 workers in B.C. in 1998. Projections from the Canadian Occupation Projection System (COPS) call for a growth rate of 0.4%, slower than the average for all occupations. Because this is such a large occupational group, there will still be a large number of employment openings. Between 1998 and 2008 it is expected that 8,800 positions will become available. Most of these openings (78%) will result from the need to replace retiring workers, and the remainder will be new jobs. A high rate of worker turnover in these occupations will create many additional openings as well.

There are a number of factors responsible for the low employment growth of this occupational group. Office automation has increased the productivity of these workers and has also shifted some of their work to other office workers, including managers and professionals. For example, most office workers now key their own correspondence. The effects of technology have reduced the demand for clerks across all industries. The impact of computers has been accompanied by a general trend of downsizing in organizations, and clerical and administrative staff have been very vulnerable to this.

Competition for employment openings is expected to remain keen as there are so many qualified people in the province looking for positions in this field. Additional competition will come from those moving to B.C. who bring appropriate experience with them. Anyone planning to enter this field must have good computer skills and should be prepared to upgrade these skills continually.

There are a number of different occupations within this occupational group. A little less than half (47%) consist of *general office clerks*. About 42% are *receptionists* and *switchboard operators*. The remaining 11% consist of *typists* and *word processing operators*, and *records* and *file clerks*. Employment of *typists* and *word processing operators* is projected to decline. Employment in all other occupations in this group is projected to grow more slowly than the all-occupation average.

Due to office automation, there are considerable changes in skills required for this occupational group. Those jobs that rely on word processing only have almost disappeared because most employers, professionals and office workers use personal computers to write their own correspondence and reports. This trend will become even more prevalent as businesses conduct more transactions through electronic means. General skills and computer skills acquired in one position are readily transferable to other positions in the same or other industries.

These are entry-level jobs that offer many opportunities for workers to advance. Those with current experience and good training will have the best chance of securing these jobs. Positions are often advertised in newspapers and at employment centres. Workers in these occupations can move into supervisory positions with experience, or they can acquire more skills, such as computer skills or sales skills, to move into related fields.

Additional Information

Canadian Health Record Association http://www.chra.ca

Related Occupations

- office equipment operators (142)
- administrative clerks (in 144 administrative support clerks)
- library, correspondence and related information clerks (145)
- front desk agents (6435)
- secretaries, recorders and transcriptionists (124)
- library technicians (in 521 technical occupations in libraries, archives, museums and galleries)
- records systems analyst (in 1122 management and advertising consultants)
- health records administrators (in 01/09 middle and other managers)

1

Office Equipment Operators

NOC 142

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	19,620	13,240	13,550

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
310	4,840	5,150

Annual Growth 1998-2008 0.2%

Main Industries of Employment

Telecommunication Carriers	13%
Finance, Insurance, and Real Estate	12%
Other Business Services	9%

Employment by Region

Lower Mainland	66%
Vancouver Island	16%
Northern B.C.	6%
Okanagan/Kootenay	12%

Self-employment 5%

Nature of the Work

Many offices now use electronic equipment that requires workers with specialized knowledge to operate them. Some of these occupations are listed here.

Computer operators operate computer systems or networks to produce computer-generated reports. *Data entry clerks* enter information onto diskettes, disks or tapes for storage and manipulation. *Typesetters* enter copy into typesetting programs to produce text that is ready to print. They include markup persons and desktop publishing operators. *Telephone operators* operate telephone systems to assist the completion of telephone calls.

Computer operators and *data entry clerks* are employed in offices and computer centres throughout the private and public sectors. *Typesetters* are employed by commercial printing companies as well as firms that have in-house printing departments. *Telephone operators* are employed by telephone companies.

Main Duties

Each of these clerks operates specialized computer programs and equipment to meet specific requirements.

Computer operators monitor the operation of computer systems and networks, operate computer programs to manipulate data and schedule the use of computer terminals and networks. They may also maintain related materials, such as loading magnetic tapes and printers. They need an understanding of computer hardware to do their work.

Data entry clerks enter data, such as invoices, forms and other records, into machine-readable form and then verify its accuracy. They type at keyboards and data entry consoles to enter source data onto computer hard drives, diskettes and tapes. They may also maintain libraries of diskettes and tapes.

Typesetters operate desktop publishing software and equipment. They mark copy with computer codes and typographic instructions, and ensure that computer codes and instructions are correctly typeset. They operate media conversion equipment to process copy transmitted through telecommunications. They also operate and load output devices and perform routine maintenance on equipment.

Telephone operators complete customers' telephone calls and operate computerized directory listing systems. They also calculate and record billing information. Senior telephone service observers train and supervise other operators.

Example Titles

computer operators (1421):

- computer operator
- computer tape librarian
- network operator
- peripheral operator
- system operator

data entry clerks (1422):

- data control clerk
- data entry clerk
- data entry operator
- data processor
- keypunch operator

typesetters (1423):

- copy marker
- apprentice graphic arts, compositor
- desktop compositor
- desktop publishing operator
- markup person
- typesetter
- typographer

telephone operators (1424):

- directory assistance operator
- telephone operator
- telephone service assistant
- telephone service observer

Education and Training

People in this field typically require grade 12, with a mathematics and computer operations background. Many organizations prefer to hire high school graduates and train them on the job. Others may hire applicants who have training and/or experience in data processing.

Graduation from a certificate or diploma program is an asset in this field. Most B.C. colleges, university colleges and the British Columbia Institute of Technology offer two-year computer technology, computer information systems and data processing programs. Grade 12 is generally the minimum prerequisite. Many courses in these programs have transfer credit to computer science bachelor's degrees offered at B.C. universities and university colleges.

Post secondary education programs in applied design and/or graphic art may also be an asset for those who wish to work in the printing industry. See the profile Photographers, Graphic Arts Technicians and Technical Occupations in Motion Pictures, Broadcasting and Performing Arts (522) for details about the educational opportunities in this area in B.C.

Completion of grade 12 is highly recommended and may be required in order to work as a telephone operator. Previous experience in customer service and switchboard or multi-line operation is necessary.

Good keyboard skills and hand-eye coordination as well as knowledge of computers and data processing systems are important in this line of work. An ability to follow instructions, basic analytical skills and good communications skills are necessary. An ability to adapt to change is important and a willingness to stay up-to-date on new technology and applications is needed. In addition, telephone operators need to speak English clearly and fluently, have good listening and communications skills and be able to answer inquiries from a variety of people quickly and effectively.

Working Conditions

These workers generally work in computer centres or offices. Some workers are required to load and operate equipment that may be dusty or dirty, though for the most part surroundings are clean and comfortable. A 35 to 40 hour week is standard, but working hours can vary. Many of these workers work shifts around the clock so that the information needs of the business or its clients can be met.

Long hours working with computerized equipment can cause physical strain. For instance, data entry operators may be expected to make 10,000 keystrokes an hour. Repetitive motion injuries, such as carpal tunnel syndrome, are possible. Sore backs and eye strain are also potential problems. For computer operators and data entry clerks especially, the work is largely solitary, though there are usually co-workers in the same area with similar duties.

Office equipment operators earned less than the average earner in the workforce, according to 1995 salary figures. These workers earned an average of $23,900, compared to the provincial average of $27,900. Full-time, full-year workers earned $32,400, compared to the provincial average of $39,400. Within this occupational group, *computer operators* had the highest full-year, full-time earnings at $38, 800. Comparable average earnings for *typesetters, telephone operators* and *data entry clerks* were $35,500, $32,800 and $29,200 respectively. Overall, the average earnings for women ($29,800) in full-time, full-year positions were considerably less than the average earnings for men ($39,800).

According to a recent student outcomes survey, the average entry-level salary for new college graduates to this occupational group was $2,170 per month. For those who work for the full year, that will mean an annual starting salary of about $26,060. Within this group, computer operators earned the most ($2,590 per month), followed by telephone operators ($2,040) and typesetters ($1,660). Data entry clerks received the least ($1,550).

Data entry clerks generally have the lowest wage in this group, whereas computer operators earn the best wages. Industry sources suggest that a well-skilled and experienced computer operator can earn as much as $43,200 for a full-time, full-year job. For the most part however, these are entry-level positions, so most workers who desire higher salaries must progress to more senior related positions (such as computer programmers) with additional training and experience.

This is a very large occupational group. In 1990 there were 19,620 workers in B.C. However, by 1998 the group had decreased by one-third to 13,240. Data entry clerks, as 63% of the workers, form the largest sub-group. Computer operators make up 21% of the workers, telephone operators make up 10%, and typesetters account for the remaining 7% of the workers.

Because most of these workers have a supporting role in offices, there is very little opportunity for self-employment. Only 5% consider themselves self-employed, which is much lower than the provincial average.

There is some opportunity for part-time work. Although a lower proportion than the provincial average, 22% of these clerks work part time. Over 75% of the workers are employed full time, but only 50% work full time, full year.

The unemployment rate for these workers is lower than the average for all occupations. There is not a seasonal variation in employment. There may be exceptions in industries that are seasonal, such as construction and forestry.

Because these clerks are found in larger offices in both the public and private sectors, no single industry dominates as an employer. Overall, the finance, insurance and real estate industry employs a significant proportion of office equipment operators (12%). At the more specific occupation level, 63% of typesetters work in the printing and publishing industry, and 88% of telephone operators work for telecommunication carriers.

About three-quarters of the workers live in the Lower Mainland and Victoria. The distribution of the remaining workers is 6% in the rest of Vancouver Island region , 12% in Okanagan/Kootenay region and 6% in Northern B.C.

Women dominate this occupational group. They account for 75% of the workers. The age distribution of workers tends to match that for the workforce as a whole. The average age of the workers is 37, which is close to the average for all occupations.

Employment Prospects

This is a very large occupational group, made up of about 13,240 workers in B.C. in 1998. Projections from the Canadian Occupation Projection System (COPS) call for a growth rate of 0.2%, slower than the average for all occupations. As it is such a large occupational group, there will still be a large number of employment openings. It is expected that 5,150 positions will become available from 1998 to 2008. Most of these openings (94%) will result from the replacement of retired workers. The remainder will result from growth in the number of new jobs. A high rate of worker turnover will create many additional openings.

There are a number of factors responsible for the low employment growth of this occupational group. Office automation has increased the productivity of these workers and, as a result, has reduced the demand for them. Some of the work that these workers did previously has been transferred to other workers because of technological changes. For example, the work of many data entry clerks has been shifted to those workers, clerical and professional, who deal directly with clients. The impact of computers has been accompanied by a general trend of downsizing in organizations, and clerical staff, such as office equipment operators, have been very vulnerable to this trend.

Competition for these employment openings is expected to remain keen as there are so many qualified people looking for positions in this field. Additional competition will come from those moving to the province who bring appropriate experience with them. Anyone planning to enter these occupations must have good computer skills and should be prepared to upgrade these skills continually.

There are a number of different types of workers within this occupational group. The majority (63%) consist of *data entry clerks*. *Computer operators* make up 21%, and the remaining 16% consist of *typesetters* and *related occupations*, and *telephone operators*. Most of the employment growth through to 2008 will be for computer operators. However, as computer operators form such a small group, the actual number of openings for this group will remain small. Most openings will be for data entry clerks.

Office automation not only has reduced employment for workers in this occupational group but also has increased the complexity and variety of the work itself. As computers and other office equipment become progressively more efficient and user friendly, the complexity of maintenance, trouble shooting and solving associated problems also increases. Consequently fewer but more highly skilled workers will be required to ensure the smooth operation of this equipment.

The skills that are acquired in the computer operating fields are readily transferable to other general clerical functions. With education and training, workers can advance to supervisory positions. A worker with a considerable knack for computer work might be able to move into a position managing a company's computers and software or, with more training, move into applications programming.

Related Occupations

- clerical occupations, general office skills (141)
- proofreader (in 145 correspondence, publication and related clerks)
- graphic designers and illustrating artists (in 524 creative designers and craftspersons)
- copy stylist, mechanical artist and paste-up artist (in 522 photographers and graphic arts
- technicians)
- computer programmers (2163)

Finance and Insurance Clerks

NOC 143

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	50,030	54,810	52,100

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
-2,710	10,890	8,180

Annual Growth 1998-2008 -0.5%

Main Industries of Employment

Finance, Insurance, and Real Estate	37%
Professional Business Services	7%
Wholesale Trade	6%

Employment by Region

Lower Mainland	66%
Vancouver Island	15%
Northern B.C.	7%
Okanagan/Kootenay	12%

Self-employment 7%

Nature of the Work

This is a very large occupational group. Financial institutions use many clerks to keep track of their records and to assist clients in their financial transactions.

Accounting clerks prepare routine financial records according to established procedures. *Payroll clerks* process payroll information to determine pay and benefits for staff. *Tellers* process customers' financial transactions and provide banking information. *Financial clerks* maintain financial information for financial institutions. *Collectors* negotiate payments on overdue accounts and bad cheques. These workers are employed throughout the private and public sectors.

Main Duties

There is a great deal of diversity in the duties of these clerks, but they all calculate and prepare financial statements, provide information on financial statements, maintain filing systems, compile reports based on financial statements and answer client inquiries. Most of the work depends on the use of specific computer programs.

Accounting and *related clerks* perform the general duties listed above, as well as compiling budget data and documents. They also calculate the costs of materials, overhead and other expenses. They use estimates, quotations, price lists and previous budgets to perform these calculations.

Payroll clerks are specifically concerned with employee pay and benefits. They maintain employee records (for example, attendance and overtime) and use the records to calculate pay and benefit entitlements. They also prepare and check statements of earnings and provide information to employees on payroll matters, benefit plans and collective agreement terms.

Tellers work directly with the clients of banks, trust companies, credit unions and other financial institutions. They process customer transactions, such as deposits and withdrawals, account transfers and other banking affairs. They also get and give information. For example, they get customer information to open new accounts and give customers information about the bank's services. This sometimes requires helping customers resolve problems with their accounts.

Bank clerks process and track large volumes of banking transactions by compiling deposit, withdrawal and payment records, and by verifying and balancing automatic teller transactions. They may also process credit applications, such as mortgages. *Insurance clerks* handle insurance policies by setting them up, renewing and cancelling them. They also review policies for appropriate coverage, calculate payments and bill policy holders, and compile and maintain information about claims and rates. *Other financial clerks* may work with rental and other real estate transactions or with various types of securities, such as pension funds.

Collectors collect payments on overdue accounts and loans. They have the additional responsibility of tracing debtors. This may mean gathering information from family and friends of debtors and talking to the debtors about the repayment of their debt.

Example Titles

accounting clerks (1431):
- accounting clerk
- accounts payable clerk
- accounts receivable clerk
- audit clerk
- tax return preparer

payroll clerks (1432):
- benefits officer
- pay and benefits clerk
- pay clerk
- payroll officer

tellers (1433):
- bank clerk
- bank teller
- customer service representative
- senior teller

banking, insurance and other financial clerks (1434):
- actuarial clerk
- bank clerk
- claims clerk
- credit clerk
- finance clerk
- insurance clerk
- mortgage clerk
- real estate clerk
- securities clerk

collectors (1435):
- bill collector
- collection officer
- credit and collection clerk
- skip tracer

©Stone/Vancouver

Education and Training

Accounting and *payroll clerks* usually require completion of grade 12 and a certificate or diploma program in accounting, bookkeeping or computer operation. Previous related work experience, including customer service and interaction with the public, is beneficial.

Office and business administration certificate and diploma programs with courses in bookkeeping and accounting are offered by most B.C. public colleges and university colleges. These programs prepare graduates for entry-level positions in both public and private enterprises. Admission requirements vary but these programs generally require grade 12, with a strong background in mathematics and English.

Bank tellers require a minimum of grade 12, preferably with business courses or some business experience, as well as knowledge of computers and software applications. On-the-job training programs are provided by banks for tellers, but completion of a teller training program is preferred. The Institute of Canadian Bankers provides education for employees of the banking industry. Okanagan University College offers a Banking Customer Service Certificate Program, which is 90 hours in length and includes practical experience.

Another relevant program that prepares students for a career in the financial services industry is the two-year Financial Services Diploma Program at Douglas College. Students have the option to participate in a cooperative education program. Current prerequisites include completion of grade 12 or equivalent.

While business certificates and diplomas may be useful, applicants with undergraduate degrees in business and commerce are more common, especially in large urban centres. These degrees are available at all public universities and university colleges in B.C. Various options are available within these programs, including accounting, finance, marketing and human resource management.

Financial clerks must have a high school diploma. Some employers recruit graduates from trade and vocational schools, colleges, university colleges, private educational institutes and universities. On-the-job training and short-term training courses specific to the financial establishment are provided once employed. Since regulations that govern the financial sector are constantly changing, financial clerks require a basic knowledge of business administration and finance.

Collectors usually require grade 12 and on-the-job training. A licence issued by the Ministry of the Attorney General is required.

Generally, persons employed in this field require an aptitude for mathematics, comfort with computers and an ability to do repetitious work accurately. They need to be personable, tactful and patient, and to have good communication skills and basic analytical skills. An ability to work under pressure at times is important. They need to be motivated and should be able to work both independently and as part of a team.

Working Conditions

Workers in these occupations work in a variety of settings. Clean, comfortable surroundings are the rule. Some work in offices, while others work at counters and deal directly with the public. Tellers may have to stand for much of the day. A 35 to 40 hour work-week is standard, though overtime or evening and weekend work may be required.

Since these clerks specialize within financial environments, they must work rapidly and accurately with figures. Increasingly, they rely on computers to do much of their work. Employers are looking for people who have practical experience with computers.

These clerks are often working directly with clients and need good communication skills. They also have to be able to think and work without a lot of direction. They need to be able to pay attention to detail.

Often the basic pay is not high, but some clerks in financial companies can earn more through bonus plans. Workers earned an average of $23,400 in 1995, which was less than the workforce average. Even those who worked full time, full year earned only $29,700, which is less than the provincial workforce average of $39,400. *Payroll clerks* had the best average salaries, at $32,900 for full-time, full-year employment. By comparison, for full-time, full-year positions, *collectors* earned an average of $31,100, *accounting* and *related clerks* earned $30,400, *banking, insurance* and *other financial clerks* earned $29,500, and *tellers* earned $25,500.

According to a recent student outcomes survey, the average entry-level salary for new college graduates to this occupational group is $1,770 per month, or about $21,200 per year. The average starting salaries for recent college graduates ranged from $1,430 per month ($17,200 per year) for tellers to $2,100 per month ($25,200 per year) for payroll clerks. (These figures are averages and include both part-time and full-time positions.) In addition, the banking industry suggests that starting salaries in 1999 for full-time, full-year work are about $23,000, with experienced and successful employees earning $30,000.

This is a very large occupational group, with 54,810 workers in 1998. This is an increase of almost 4,800 workers since 1990. About 54% of this group are accounting clerks, and 22% are tellers. Payroll clerks constitute 9%, financial clerks constitute 12%, and collectors constitute 3%.

People in these occupations are employed in offices, with little opportunity for self-employment. About 7% are self-employed, which compares to 15% for the workforce overall.

About a quarter of all the workers in this occupational group are part-time employees, which is comparable to the proportion of part-time workers in all occupations. Workers who prefer part-time employment may find these occupations worth considering, particularly tellers, where 41% report part-time employment. However, over half (54%) of all the workers in this occupational group do work full time for the whole year.

The unemployment rate in this occupational group is lower than the average for all occupations, and while workers in this group do not tend to face seasonal variations, their employment may be influenced by business cycles.

The finance, insurance, and real estate industry employs 97% of tellers, 89% of financial clerks and 7% of the balance of workers in this occupational group. The other concentration of these clerks is in the retail and wholesale trades, which account for 21% of accounting clerks, 11% of the payroll clerks and 2% of the balance of the workers in this occupational group.

While these workers are distributed throughout the province, the Lower Mainland has a higher proportion (66%) than the average workforce distribution. This reflects the fact that there is a higher concentration of financial institutions in the Lower Mainland because of the commercial activity in that area.

Over 85% of these workers are women. The distribution of age groups generally resembles that for all occupations, with a slight overrepresentation of workers who are 25 to 44 years of age. (There are 61% of these clerks in this age group, compared to 53% for the workforce as a whole.) The average age of 38 for workers in this occupational group is the same as the average for all occupations. At the specific occupation level, it is worth noting that tellers tend to be younger than other workers in this occupational grouping. The average age is 35, and 19% of tellers are under 25 years old.

Employment Prospects

This is a very large occupational group, made up of about 54,810 workers in B.C. in 1998. The Canadian Occupation Projection System (COPS) projects a decline in employment of 0.5% per year from 1998 through to 2008. This means that by 2008 employment for this occupational group will decline by 2,710. Despite this decline, there will still be a large number of employment openings. There will be a need to replace the large number of workers who will retire. As a result, between 1998 and 2008 there will be 8,180 openings. A high rate of worker turnover will create many additional job openings.

There are a number of factors responsible for the job loss in this occupational group. The main industry employing these workers is the finance, insurance and real estate industry. It typically employs around 37% of these workers, but this industry is experiencing sluggish employment growth. Office automation has increased the productivity of these workers and, as a result, reduced the demand for them. The impact of computers has been accompanied by a general trend of downsizing in organizations, and clerical and administrative staff have been very vulnerable to this trend.

Competition for these employment openings is expected to remain keen as there are so many qualified people looking for positions in this field. Industry sources indicate that there is a current surplus of qualified workers in B.C. Additional competition will come from those moving to the province who bring appropriate experience with them.

There are a number of different types of workers within this occupational group. About half (54%) consist of accounting and related clerks. Tellers and related financial services positions make up 22%. The remaining 24% consist of payroll clerks, banking, insurance and other financial clerks, and collectors. All of these groups of workers will experience either a decline or slower than average growth in employment through to 2008. The proportion of total openings for this entire occupational group within each of these sub-groups is closely tied to their relative sizes.

Office automation not only will reduce employment for workers in this occupational group but also will increase the complexity and variety of the work itself. More companies and departments use computerized financial and accounting systems. Consequently fewer but more highly skilled workers will be required. Anyone planning to enter this field must have good computer skills and should be prepared to upgrade these skills continually.

The trend toward part-time work or contract employment will increase in financial institutions so that employers have workers available only for the times that are busy. Entry-level positions at banks especially are often part time or casual.

As these are entry-level positions, there is considerable potential for advancement. Industry sources indicate that self-managed individuals with strong initiative who are willing to learn new skills continuously and upgrade old ones are the most likely candidates for promotion. Others can acquire additional skills to advance to more highly-skilled jobs, such as bookkeepers and loans officers, within the financial industry.

Openings in this field are often advertised in local newspapers and at employment centres. The most visible employers, large banks for instance, often do not have to advertise but choose new employees from the many job-seekers who come to them directly.

Additional Information

Institute of Canadian Bankers http://www.icb.org

Related Occupations

- clerical occupations, general office skills (141)
- administrative support clerks (144)
- library, correspondence and related clerks (145)
- personnel and recruitment officers (1223)
- tax collection officer (in 1228 immigration, employment insurance and revenue officers)
- bookkeepers (1231)
- loans officers (1232)
- financial auditors and accountants (1111)

There is a great deal of diversity in the duties of these clerks, but they all calculate and prepare financial statements, provide information on financial statements, maintain filing systems, compile reports based on financial statements and answer client inquiries. Most of the work depends on the use of specific computer programs.

Administrative Support Clerks

NOC 144

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	18,540	14,920	17,920

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
3,000	6,770	9,770

Annual Growth 1998-2008	1.8%
Main Industries of Employment	
Other Service Industries	10%
Wood Manufacturing	10%
Provincial and Territorial Administration	9%
Employment by Region	
Lower Mainland	64%
Vancouver Island	19%
Northern B.C.	7%
Okanagan/Kootenay	10%
Self-employment	4%

Nature of the Work

Throughout the public and private sectors clerks are required to process information. They compile and verify information relating to administrative processes and prepare reports based on that information.

Administrative clerks process applications, licences, permits, contracts, registrations and requisitions. *Personnel clerks* process information related to staffing in large organizations. *Court clerks* perform support functions in courts of law, such as calling the court to order, preparing court dockets and maintaining exhibits.

Main Duties

Although the type of information processed varies for each job, generally clerks process forms and documents according to established procedures and schedules. In the case of *administrative clerks*, these forms relate to legal documents, contracts and requisitions, while *personnel clerks* keep personnel records. Although many of their functions are the same as general office clerks, administrative clerks do a number of specialized jobs, such as issue licences, permits or other documents. Because these are legal agreements, these clerks must be aware of the relevant laws and regulations. They must ensure that the documents adhere to the legal restrictions. In addition to other duties, personnel clerks take part in the hiring process by advertising vacancies and screening applications. They may also arrange training activities.

Both of these types of clerks maintain filing systems, prepare reports and documents, and provide information to staff and the general public regarding company policies and procedures. Much of their work requires the use of computerized information systems. Administrative and personnel clerks work in larger companies and government agencies.

Court clerks prepare court dockets and exhibits and maintain court office files on court actions and decisions. They also assist the public in court offices and collect and administer fines and fees. Court clerks, who are the most specialized of this group, work only for the federal and provincial law courts.

Example Titles

administrative clerks (1441):
- administrative clerk
- by-law clerk
- customs clerk
- documentation clerk
- import clerk
- licence clerk
- passport clerk
- ward clerk
- warranty clerk

personnel clerks (1442):
- human resources clerk
- personnel clerk
- staffing clerk

court clerks (1443):
- court clerk
- judicial clerk
- provincial court clerk

Education and Training

Administrative support clerks require grade 12, with typing and computer skills. Work experience involving general office procedures, computing, filing and dealing with the public is a strong asset. Many organizations hire high school graduates and train them on the job. Other employers may require completion of business office training courses.

Most B.C. colleges and university colleges offer programs that teach basic office skills and office administration. These programs train students in areas such as typing, reception, office systems and word processing. Admission requirements vary, and program lengths also vary from a few months up to about a year. For those seeking promotion, advanced courses in office management and business administration are recommended.

Camosun College, College of the Rockies, Douglas College, Northern Lights College and Selkirk College have diploma programs in office management for those interested in supervisory positions. Admission requirements vary, but usually grade 12 English and grade 10 mathematics are required. Upgrading programs are available at all public colleges and university colleges.

Personnel clerks may require specialized courses as part of on-the-job training.

Court clerk positions are with the Court Services Branch of the B.C. Ministry of the Attorney General. Hiring for entry-level positions is conducted through the Recruitment Access Office of the Public Service Employee Relations

Commission. Career advancement is through on-the-job training and experience.

Hand-eye coordination, attention to detail and an ability to follow instructions are necessary for these positions. Effective organizational and communication skills and an ability to deal with the public in a confident and courteous manner are required. Continual updating of skills is necessary in order to remain competitive.

Working Conditions

This is a very large occupational group, with workers employed in almost every kind of business and government. These clerks must use the standard office equipment, such as computers, fax machines and copiers, but more of their work involves interacting with other people. They often need good people skills to work with others. Usually they work behind a desk in an office and do a lot of careful, detailed work to keep accurate records.

The average earnings for workers in 1995 were $27,200, a little below the average for the workforce. People in full-time, full-year positions earned an average of $32,600 for *administrative clerks*, $34,400 for *court clerks* and $35,100 for *personnel clerks*. These earnings are below the average full-time, full-year earnings for the workforce ($39,400). Industry sources indicate that well-qualified experienced workers can expect to earn as much as $36,000 per year for full-time, full-year employment. As many of these positions are entry level, workers who want higher salaries must move on to related, more senior positions, such as executive assistant or court officer.

In a survey of recent college graduates, the available data indicated that new entrants to the position of administrative clerk earned $2,060 per month ($24,700 per year), and new entrants to the position of personnel clerk earned $2,210 per month ($26,500 per year).

This is a very large occupational group, with 14,920 employees in 1998, but it has seen a decrease of about 3,600 workers since 1990.

Administrative clerks are the largest sub-group. They make up 89% of this occupational group, while personnel clerks constitute 8% of this group, and court clerks constitute 3%.

The work is primarily full time, with little opportunity for self-employment. About 4% are self-employed, and 19% work part time. About 60% work full time, full year.

The unemployment rate is lower than the average for all occupations. Since these workers work in a variety of offices in all industries, there is little seasonal variation in their employment.

These workers are employed widely in both the public and private sectors with no dominating industry. The federal, provincial and local administrations together employ 20% of these workers, hospitals employ another 8%, the wood manufacturing industry employs 10%, and business and professional services together employ 9%.

About 78% of these jobs are located in the Lower Mainland and Victoria. This work is mainly urban because that is where the larger companies and government agencies have their main offices.

Women make up 84% of the workers in this group, compared to 46% for the workforce as a whole. Almost two-thirds of the workers (62%) are in the 25 to 44 age range, compared to 53% for all occupations. In contrast, only 6% of the workers are under 25 years of age, compared to 15% for the workforce as a whole. The average age for this occupational group is 39.

Employment Prospects

This is a very large occupational group, made up of about 14,920 workers in B.C. in 1998. Projections from the Canadian Occupation Projection System (COPS) call for a growth rate of 1.8%, about as fast as the average for all occupations. Between 1998 and 2008 a total of 9,770 positions will become available. Most of these openings (70%) will result from the replacement of workers who retire. The remainder will result from growth in new jobs. A high rate of worker turnover will create many additional openings.

Office automation is increasing the efficiency and at the same time reducing the demand for other clerical staff. Due to the fact that personal interactions are common to these occupations, these workers are less affected by computerization than most other clerical workers. Many duties of administrative support clerks, such as scheduling conferences, are not easily automated. This means that as computers continue to reduce the number of clerical jobs for staff performing routine data transcription tasks, the proportion of administrative support clerks to total clerical positions will increase. Since workers in this occupational group are capable of performing most tasks that other clerical workers have traditionally done, employers have a growing justification for hiring these workers.

As more companies and departments replace the need for other clerical staff by shifting automated tasks to administrative support clerks, the complexity and variety of the work itself has also increased. These workers must be willing to learn new skills continuously and upgrade old ones, especially computer skills.

About 89% of the workers in this occupational group are *administrative clerks*, and this is where 88% of the openings through to 2008 will be. *Personnel clerks* account for about 10% of the employment openings, and the remaining 2% are for *court clerks*.

Through experience and training, administrative support clerks can advance to senior positions or more highly skilled positions, such as administrative officers, personnel officers or court officers.

Additional Information

B.C. Public Service Employee Relations Commission
Recruitment Access Office http://rao.gov.bc.ca

Related Occupations

administrative clerks:

- general office clerks (in 141 clerical occupations, general office skills)
- administrative officers (1221)
- executive assistants (1222)

personnel clerks:

- payroll clerks (in 143 finance and insurance clerks)
- personnel and recruitment officers (1223)
- human resources specialists (1121)
- college and other vocational instructors (4131)

court clerks:

- court recorders (in 124 secretaries, recorders and transcriptionists)
- court officers and justices of the peace (1227)

Library, Correspondence and Related Information Clerks

NOC 145

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	17,780	18,590	19,370

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
780	5,960	6,740

Annual Growth 1998-2008 0.4%

Main Industries of Employment

Retail Trade	17%
Federal Administration	14%
Telecommunication Carriers	11%

Employment by Region

Lower Mainland	65%
Vancouver Island	17%
Northern B.C.	6%
Okanagan/Kootenay	12%

Self-employment 3%

Nature of the Work

Many large organizations in both the public and private sectors require clerks to gather or distribute specialized information.

Library clerks circulate library materials, shelve books and supply general library information. *Publication clerks* write routine correspondence, compile material for publication and perform other related duties. *Customer service clerks* supply information regarding a firm's goods, services and policies, and receive payments and process requests. *Survey interviewers* gather information for market research, public opinion polls and census enumeration. *Statistical clerks* bring together interview and other data into reports.

These clerks are employed by libraries, newspapers, periodicals, publishing firms, retail stores, insurance agents and utility companies. Interviewers and statistical clerks are employed by market research firms, government agencies and utility companies.

Main Duties

Although these clerks perform general clerical duties, such as filing, preparing reports and providing information, each has different functions.

Library clerks issue and receive library books, reshelve books and assist library users in obtaining library materials.

Publication clerks and editorial assistants assist in the preparation of periodicals, advertisements, catalogues and directories. Proofreaders proofread material and verify facts before publications are printed. Those in classified advertising receive customers' orders, write and edit copy, calculate advertising rates and bill customers. Those in press clipping services read newspapers, magazines and various periodicals to locate and file articles of interest to staff and clients.

Customer service clerks in retail stores answer enquiries, investigate complaints, arrange for refunds and receive account payments. In insurance, telephone and utility companies, they explain the services offered, obtain information required for services, arrange for billing and receive payment for services. Note that the term "customer service representative" is often used to describe positions that are mainly sales-related. This particular group does not act in a sales function routinely, although some employers may require it.

Survey interviewers contact individuals by telephone or in person, ask questions from questionnaires and surveys, enter data into computers and compile interview data into reports and lists. They may be doing marketing or public opinion research or enumerating for elections or census. *Statistical clerks* check and code statistical information and enter data into computer databases. They also carry out routine statistical analysis of data and prepare data for reports and lists.

Example Titles

library clerks (1451):

- circulation clerk
- library clerk
- interlibrary loan clerk
- reference clerk

correspondence and publication clerks (1452):

- advertising clerk
- correspondence clerk
- editorial assistant
- proofreader
- reader

customer service, information and related clerks (1453):

- account information clerk
- complaint clerk

- courtesy desk clerk
- customer service clerk
- information clerk
- tourist information clerk

survey interviewers and statistical clerks (1454):

- census enumerator
- interview clerk
- statistical clerk
- survey interviewer
- telephone survey clerk

Education and Training

High school graduation, with secretarial, business and computer courses, as well as completion of a post secondary office program, are the usual prerequisites for those who apply for these jobs. Courses in writing, journalism or a related field may be required for those who wish to work for a publishing firm, and completion of a program in library technology is an asset for those who wish to work as library clerks.

Most B.C. colleges and university colleges offer programs that teach basic office skills/office administration. These programs train students in areas such as typing, reception, office systems and word processing. Admission requirements vary, and program lengths also vary from a few months up to about a year. For those seeking promotion, advanced courses in office management and business administration are recommended.

Langara College and University College of the Fraser Valley offer two-year library technician diploma programs that prepare graduates for clerical and para-professional duties in libraries. Admission requires grade 12, attendance at an interview and passing the required testing. Applicants should be interested in people and books and have an ability to deal with details accurately.

Individuals interested in career advancement in this field should refer to the profile Librarians, Archivists, Conservators and Curators (511).

Knowledge of computerized systems, good communication skills, basic analytical skills and an ability to follow instructions are important qualities for people in these occupations. They should also enjoy routine, clearly organized work and attainment of precise standards.

Working Conditions

These clerks work indoors under good physical conditions. They generally work normal office hours. However, many stores and libraries have extended hours, and clerks work whenever these places are open. Some evening and weekend work is involved. A significant number of these clerks work part time.

The increasing use of electronic information storage and retrieval systems for business records and library catalogues has created a demand for clerks who are familiar with computerized systems. Those clerks who will be working with statistical data need good analytical skills and the ability to deal with details accurately.

These workers earned less than the average earnings for the workforce, according to 1995 salary figures. Their average earnings were $18,700, while full-time, full-year employees in this field earned an average of $30,200. By comparison, the average earnings of all people working in the province were $27,900, and all people working full time, full year averaged $39,400. It should be noted that survey interviewers and statistical clerks earned significantly less than the rest of the workers in this occupational group. The average earnings for full-time, full-year employees working as survey interviewers and statistical clerks was $23,700.

According to a survey of recent college graduates, the average salary for new entrants ranged from $1,000 to $2,070 per month. The library clerks started at the lower range, while correspondence and publication related clerks were at the upper range.

This is a very large occupational group, with about 17,780 workers in 1990. This number grew to about 18,590 workers by 1998. As 72% of this occupational group, customer service clerks form the largest sub-group. Survey interviewers and statistical clerks make up 18%, library clerks make up 7%, and correspondence and publication related clerks make up 4% of this occupational group.

There are few opportunities for self-employment for these workers. Only about 3% are self-employed. However, these occupations provide opportunities for those who desire part-time work. Part-time employees make up 37% of this group, compared to 26% for the general workforce. Less than 40% of the group work full time, full year, and 25% work full time for part of the year.

The unemployment rate for this group is lower than the average for all occupations. There is no general reason for seasonal employment, though workers in seasonal operations, such as tourist recreation facilities, may face seasonal slow-downs or layoffs.

The federal and provincial governments employ 17% of these workers. The other major employers are retail trade (17%), telecommunication carriers (11%) and wholesale trade (9%). These workers tend to live in urban areas. About 74% live in the Lower Mainland and Victoria.

Most of these workers are women (71%). On average, the men in this group are younger than the women. Over half of all the workers are under 35. The average age of these workers is 35, which is younger than the average age for the workforce. These facts indicate that these are entry-level occupations.

Employment Prospects

This is a very large occupational group, made up of about 18,590 workers in B.C. in 1998. Projections from the Canadian Occupation Projection System (COPS) call for a growth rate of 0.4%, slower than the average for all occupations. As it is such a large occupational group, there will still be a large number of employment openings. Between 1998 and

2008 it is expected that 6,740 positions will become available. The large majority of these (88%) will result from the replacement of workers who retire. The remainder will result from growth in the number of new jobs. Since many of these jobs are entry level positions, a high rate of worker turnover will create many additional openings.

There are a number of different occupations within this occupational group. Almost three-quarters (72%) of these workers are *customer service, information* and *related clerks*. A total of 5,530 openings are projected for positions in this field. About 18% of the workers in this group are *survey interviewers* and *statistical clerks*. Employment in this occupation is projected to decline, and the 550 openings that are projected for this occupation are to replace retired workers. The remaining 10% of workers in this group are either *library clerks*, or *correspondence, publication* and *related clerks*. A total of 660 openings are projected to become available for these two occupations.

There are a number of factors responsible for the low employment growth of this occupational group. Office automation has increased the productivity of these workers and has shifted some of their work to other office workers, including managers and professionals. For example, most office workers now key their own correspondence. In some cases, technology has also shifted "work" to clients or service users. In some cases, machines have replaced workers. For example, voice messaging systems are increasingly being used in place of clerks who otherwise would provide customers and the public with frequently requested information. The effects of this technology have reduced the demand for these workers across all industries. The impact of computers has been accompanied by a general trend of downsizing in organizations, and clerical and administrative staff have been very vulnerable to this.

Office automation will affect all jobs within this occupational group. However, many of the tasks that these workers perform, such as those that require a more personal interactive approach, can not be automated easily. As some jobs will be lost due to office automation, the remaining workers will do more computerized tasks, increasing the complexity and variety of the work they do.

Competition for employment openings is expected to remain keen as there are so many qualified people in the province looking for positions in this field. Additional competition will come from those moving to B.C. who bring appropriate experience with them. Anyone planning to enter these occupations must have good computer skills and should be prepared to upgrade these skills continually.

Employment opportunities with government employers are generally advertised, either in newspapers or through regular job postings. Other opportunities may also be advertised, though many employers accept applications and enquiries and then hire from this pool of applicants. Through experience and some additional training, advancement to supervisory positions or more highly skilled positions, such as library technician, is possible.

Related Occupations

library clerks:

- library technician (in 521, technical occupations in libraries)
- librarians (in 511 librarians, archivists, conservators and curators)
- *publication clerks:*
- writing, translating and public relations professionals (512)

customer service clerks:

- receptionists and switchboard operators (in 141 clerical occupations, general office skills)
- customer service representative in financial institutions (in 143 finance and insurance clerks)
- retail salespersons and sales clerks (6421)
- general ticket and information clerk (in 6433 airline sales and service agents)

survey interviewers:

- telemarketer (in 662 other sales and related occupations)
- statistician (in 2161 mathematicians, statisticians and actuaries)

Mail and Message Distribution Occupations

NOC 146

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	11,700	14,670	14,480

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
-190	4,720	4,530

Annual Growth 1998-2008 -0.1%

Main Industries of Employment

Postal and Courier Services	74%
Retail Trade	10%
Printing and Publishing	6%

Employment by Region

Lower Mainland	62%
Vancouver Island	19%
Northern B.C.	6%
Okanagan/Kootenay	13%

Self-employment 8%

Nature of the Work

Because businesses and individuals need to communicate with each other, this is a very large occupational group. Even in the age of electronic communications there is a need for the delivery of documents or parcels. There must be workers to serve this need. Mail and message distribution clerks sell services to customers or ensure that material gets distributed in large offices. They sort material to see that it is sent to the proper destination, to the proper delivery route or to the proper person.

Most of these clerks are employed by Canada Post Corporation or by courier and parcel express services. Larger offices throughout the public and private sectors employ some of these clerks to distribute internal mail and to carry documents or cheques to important clients.

Main Duties

These clerks carry out a variety of tasks to get mail from a sender to a receiver. This group includes postal clerks, letter carriers and couriers.

Postal clerks sell mail services directly to customers at customer service outlets. They advise customers on the services available and the costs, and arrange for payment. They also sort mail according to destination and route mail to the proper delivery stream.

Letter carriers and *couriers* and *messengers* deliver letters, small parcels and other printed matter. They collect payment for COD items. In some cases, they record items received and delivered. This increasingly involves the use of electronic tracking systems. Letter carriers pick up their whole delivery amount from a central dispatch or dropoff point. They are employed exclusively by the Canada Post Corporation.

Couriers and *messengers* perform the duties above, usually focussing on business customers rather than on private individuals. They often carry the delivery directly from the sender to the receiver. They are often on a tight schedule, since customers pay to have documents and goods delivered quickly.

Example Titles

mail and postal clerks (1461):
- express mail clerk
- mail room clerk
- mail sorter
- postal clerk
- postal counter clerk

letter carriers (1462):
- letter carrier
- mail carrier

couriers and messengers (1463):
- courier
- delivery person, customer service
- flyer distributor
- messenger
- runner

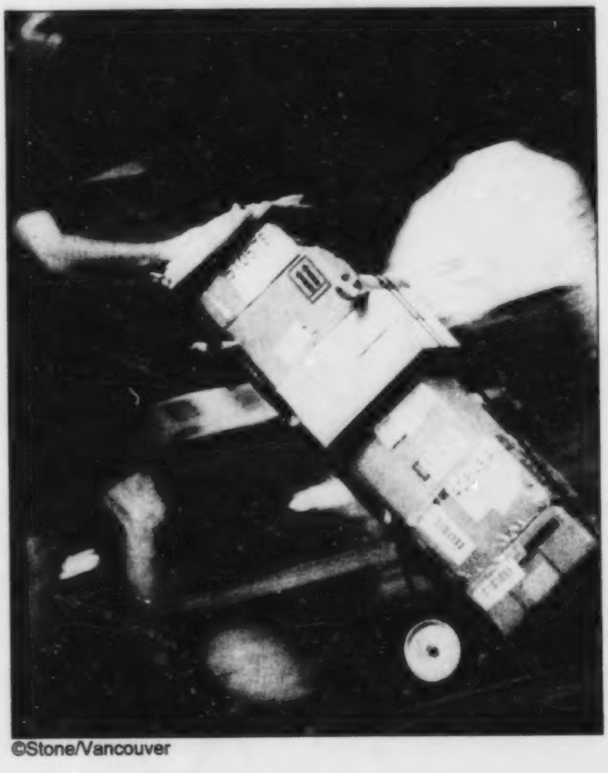
Education and Training

Postal clerks and *letter carriers* receive on-the-job training provided by the employer, which includes classroom and practical education. Letter carriers receive between two weeks and one month of training at Canada Post Corporation. As new services and products become available, additional training is provided for both postal clerks and letter carriers. With experience and additional training employees may progress to supervisory positions.

Finger dexterity and physical stamina are generally required. Skills in certain activities, such as typing or playing the piano, are transferable to sorting mail and operating equipment. An ability to lift 25 kilograms repeatedly is a common standard regarding physical stamina. Computer literacy is usually important. A stable work background that includes warehouse work or professional driving is a definite asset. Letter carriers require a valid driver's licence and a safe driving record.

Postal clerks and letter carriers must be self-starters who are able to make decisions and work independently. They must have strong organizational skills, good reading skills and a good memory for names and numbers. Basic mathematics skills and good handwriting are required. Since they deal with the public these people must be able to communicate effectively in a courteous manner.

Generally, *messengers* and *couriers* need some high school education. Many employers prefer to hire experienced people but may hire someone without experience if the person shows a strong interest in the work. Many courier companies prefer to hire owner-operators on a contract basis. These people must be able to lift up to 25 kilograms, should know the geography of the area they are serving and must be able to read maps. English skills are necessary, and a second language may be a strong asset, depending on the community being served. Some couriers need to be eligible for bonding.



©Stone/Vancouver

Bicycle, motorcycle, car and truck couriers usually own and operate their own vehicles. Cyclists need to have their own bicycle, be very fit and be able to ride most of the day. Motor vehicle drivers need a Class 5 licence with a clean driving record and commercial insurance as well as a reliable vehicle.

Many messengers and couriers choose this work because it involves working with little direction or supervision from others. Since they are not under constant supervision, they must be self-disciplined, conscientious and reliable. Generally, they must be willing to work shifts, and long working days may be required.

Working Conditions

These clerks work under a variety of conditions, ranging from delivering letters on a route to sorting mail in a large office to selling stamps in a retail postal outlet. They may ride a bicycle on the streets of Vancouver, be stationed in a rural post office in McBride or walk a route in Kelowna. Deliveries must be made in all weather. Regardless of which situation they work in, they have to pay attention to detail to ensure that messages do not go astray. Most work week-day hours, though some jobs will require evening, weekend or shift work.

On average, these workers earned $21,100 per year in 1995. Men earned $22,400, which is more than their women counterparts, who earned $19,200. Full-time, full-year workers earned an average of $32,900. At the individual occupation level, couriers and messengers earned an average of $29,100 for full-time, full-year work, mail and postal-related clerks earned $32,900, and letter carriers earned $35,700. These earnings are below provincial workforce averages. Some self-employed couriers work for a percentage of delivery fees.

According to the Canadian Union of Postal Workers, at the beginning of 1996 salaries for entry-level workers at Canada Post ranged from $2,640 to $2,790 per month, or $31,680 to $33,480 per year. Experienced workers earned from $2,700 per month to $2,860 per month.

Recent college graduates who entered these jobs earned between $1,720 and $2,370 per month ($20,600 to $28,500 per year). Couriers and postal-related clerks earned less than letter carriers. Most new entrants start as temporary or casual workers.

The strong need for people and businesses to communicate causes this occupational group to be very large. About 14,670 people were employed in this occupational group in 1998, which is an increase of 2,970 workers from 1990. Couriers are the most numerous, with 41% of the workers, and letter carriers are the smallest group, with 28% of the workers. Mail, postal and related clerks comprise 32%.

Due to the nature of their work, most of these workers are employed by larger companies. About 8% are self-employed, compared to 15% for the workforce overall. For those interested in part-time employment, these may be occupations to consider. About 37% of these workers work part time. By comparison, the all-occupation rate for part-time employment in B.C. is 26%. About 63% of the workers work full time, and 45% work full time, full year.

The unemployment rate for this group is less than the average for all occupations. The work is not particularly seasonal, although the post office hires some extra staff during the Christmas rush.

Almost three-quarters of these workers (74%) work for postal and courier services, which includes Canada Post. The only other major employer is the retail trade, which employs 10% of the workers. This would include individuals who work in retail postal outlets, such as those found in many drug stores.

Although these workers work throughout the province, larger companies use their services most heavily. Thus, over 70% of these workers live in the Lower Mainland and Victoria.

About 41% of the workers are women, which is a little below the proportion of women in the workforce (46%). The age distribution for these workers is very close to that for the general workforce, but there is a slightly greater proportion of workers in the 15 to 24 age group than for the workforce in general. The average age of these workers is 37, compared to 38 for all occupations. Many younger workers take on bicycle courier positions because they enjoy the physical exercise they get in this entry-level position.

Employment Prospects

This is a very large occupational group, made up of about 14,670 workers in B.C. in 1998. Projections from the Canadian Occupation Projection System (COPS) call for a decline in total employment at the rate of 0.1% per year from 1998 through to 2008. As this is a very large occupational group, the need to replace retiring workers will create openings that more than compensate for the job loss and that will result in 4,530 openings between 1998 and 2008. A high rate of worker turnover will create many additional job openings.

A number of factors are responsible for the decline in employment of this occupational group. The majority (roughly 74%) of these workers are employed in the postal and courier services industry, which is experiencing sluggish growth. This industry includes many small businesses and courier companies as well as the Canada Post Corporation. Access to and advances in other sources of communication and data transfer systems, such as fax, e-mail and Web sites, will continue to reduce the amount of physical material that passes through the postal and courier services industry. Legislation giving legal validity to electronic signatures is expected soon, and this will help enable the growth in electronic and Internet-based business transactions. Reductions in long distance telephone rates will also help to reduce the amount of posted physical material. Increases in the automation of mail handling will increase the productivity of workers, reducing the number of people required to process the same amount of material.

One possible source of employment growth for this occupational group is a result of the trend toward consumers shopping from Web sites and shopping by telephone from catalogues. This could increase the flow of goods purchased this way and delivered through the mail system. It is difficult to predict how significant this trend will be in B.C. In addition, many of these goods come from the US and other foreign countries and are not always taxed. New methods of taxing such imports to Canada may be developed, and that could curb this flow of goods.

This occupational group includes *mail, postal* and *related clerks*, which make up 32% of this group, *letter carriers* (28%), and *couriers* and *messengers* (41%). Employment openings will be roughly proportional to the relative size of each of these.

This occupational group is very sensitive to the level of economic activity because the number of parcels handled depends on general economic conditions. During periods of poor economic conditions, people send fewer parcels.

Canada Post accepts applications from job-seekers and sometimes posts or advertises vacancies. New employees usually start in temporary or casual positions. Some employers advertise or post openings at employment centres, while others choose from the pool of applicants who directly approach them. With experience these clerks can advance to supervisory positions or become self-employed couriers.

Related Occupations

- delivery drivers (in 741 motor vehicle and transit drivers)
- general office clerk (141)
- retail clerks (6421)

> ***Many messengers and couriers choose this work because it involves working with little direction or supervision from others. Since they are not under constant supervision, they must be self-disciplined, conscientious and reliable. Generally, they must be willing to work shifts, and long working days may be required.***

Recording, Scheduling and Distributing Occupations

NOC 147

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	21,810	25,200	28,430

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
3,230	5,600	8,830

Annual Growth 1998-2008 1.2%

Main Industries of Employment

Wholesale Trade	23%
Retail Trade	21%
Public Transit and Other Transportation	4%

Employment by Region

Lower Mainland	68%
Vancouver Island	12%
Northern B.C.	8%
Okanagan/Kootenay	12%

Self-employment 2%

Nature of the Work

Many companies require clerks to oversee the flow of goods and people through their operations. These people look after inventories and schedule workers to ensure the smooth handling of production.

Shippers and *receivers* record the movement of stock in retail shops, wholesale stores and manufacturing companies. *Parts clerks* sell parts to the public in retail and wholesale stores, or issue supplies to staff in large companies, repair shops, hospitals and the armed forces. *Production clerks* record the flow of work and materials in manufacturing and construction companies. *Purchasing* and *inventory clerks* process purchasing transactions and maintain inventories in retail and wholesale stores, manufacturing companies and government agencies.

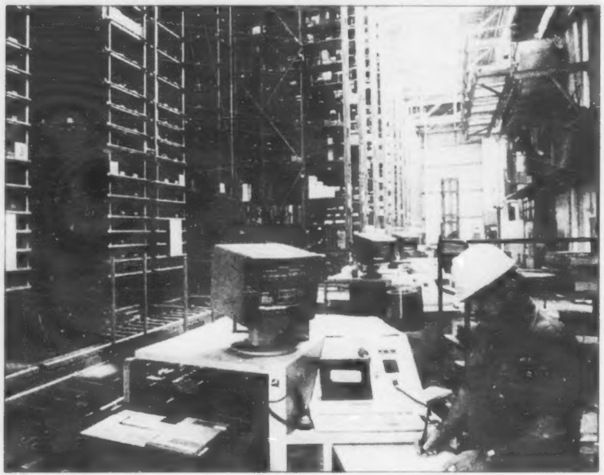
Dispatchers transmit messages to vehicles at police, fire and health departments, other emergency service agencies, taxi, delivery and courier services, and utility companies. *Radio operators* receive and transmit messages in transportation companies, industrial firms and the armed forces. *Transportation route* and *crew schedulers* prepare schedules for transportation equipment and operating personnel at municipal transit commissions, trucking companies, railways, airlines and other transportation firms.

Main Duties

Although there is a wide range of responsibilities in these occupations, they can be divided into goods handling clerks and people scheduling clerks. *Shippers* and *receivers, parts clerks*, and *purchasing* and *inventory clerks* are all goods handling clerks. *Dispatchers* and *transportation route* and *crew schedulers* deal with people. *Production clerks* are responsible for both goods and people. All of these clerks use computerized information management systems to keep records and track activities.

Goods handling clerks ensure goods are distributed from manufacturers to final consumers. They are concerned with shipping goods from factories to warehouses to retail outlets. Those responsible for shipping out goods determine the amount to be shipped and method of shipment, and they prepare shipping documents. Those responsible for receiving goods also sort incoming parts, supplies and materials. All of these clerks maintain records of amount, kind and location of parts and supplies shipped or received. They process purchases within purchasing authority, and they reconcile calculated inventories with physical counts.

People scheduling clerks are required to ensure the efficient organization of people to meet work requirements. They process and transmit information and instructions to crews and equipment. For example, a *transit scheduler* assigns drivers to specific bus routes, and a *911 dispatcher* accepts and relays instructions for emergency crews. *Production clerks* estimate the amount of materials and labour required for small projects, and they schedule production runs in a cost-efficient and time-efficient manner. They all maintain work records.



©Stone/Vancouver

Example Titles

shippers and receivers (1471):

- freight shipper/receiver
- receiver
- shipper
- shipping agent
- shipping and receiving clerk

storekeepers and parts clerks (1472):

- apprentice automotive partsperson
- automotive partsperson
- medical supply clerk
- parts clerk
- storekeeper

production clerks (1473):

- material estimator
- production coordinator
- production scheduler
- scheduling clerk

purchasing and inventory clerks (1474):

- inventory clerk
- inventory control clerk
- procurement clerk
- purchasing assistant
- stock clerk

dispatchers and radio operators (1475):

- 911 dispatcher
- dispatcher
- mobile equipment dispatcher
- radio operator
- taxi dispatcher

transportation route and crew schedulers (1476):

- flight crew scheduler
- schedule analyst
- schedule writer, transportation
- transit scheduler
- truck scheduler

Education and Training

No specific field of study leads to employment as a shipping and receiving clerk. The typical educational requirement is high school graduation. Most shipping and receiving clerks start as warehouse workers and are promoted if they prove to be competent and demonstrate an interest in paperwork. On-the-job training is common.

For those interested in careers in marine shipping, airlines, railroads, trading, custom brokering, freight forwarding, pool car operations, manufacturing and warehouse distribution, the British Columbia Institute of Technology (BCIT) offers a two-year International Trade and Transportation diploma program. Graduates receive broad training in the fundamentals of business and their application to trade and transportation. Vancouver Community College offers a Traffic, Customs and Transportation program. Students of this nine-month certificate program study the transportation system and how it relates to international trade and the economy of Canada. Admission to these programs requires grade 12.

For those who want to pursue employment as a partsperson, there are entry-level programs at Kwantlen University College, University College of the Cariboo and University College of the Fraser Valley. These programs provide general background, which may enhance chances of employment at a place of business at which an apprenticeship may be completed. As well, experience in a related clerical occupation or as a warehouse worker may be an asset.

While certification is not required to work in the parts trade, three different apprenticeship programs are available. The three-year apprenticeships are automotive partsperson, industrial engines and equipment partsperson, and industrial warehouseperson. Recommended education prior to entering an apprenticeship is grade 10 or equivalent, with English, mathematics and science, but grade 12 is preferred by the Industry Training and Apprenticeship Commission (ITAC). Each apprenticeship involves 360 hours of technical training taken at Kwantlen University College, plus 5,040 hours of work experience with a suitable employer. Students may receive credit for prior work experience or training. Upon completion of the apprenticeship, an apprentice must pass an interprovincial standards examination to receive a Certificate of Qualification with an interprovincial Red Seal endorsement.

For people who have worked for a long time in parts, but who have never completed an apprenticeship, a Certificate of Qualification is available. The certificate is awarded following submission of evidence of four and one-half years' full-time experience in the trade, plus successful completion of an exam.

Current details regarding these apprenticeships can be obtained by contacting an ITAC area office.

The minimum educational requirement for production clerks is a high school diploma, preferably with courses in mathematics, accounting and operation of business machines. Basic computer skills are necessary. Most employers provide new employees with on-the-job training.

Purchasing and inventory clerks usually require grade 12, and courses in purchasing management. An ability to operate a computerized inventory system is needed. A Certificate in Purchasing Program, Certified Professional Purchaser accreditation program and courses in purchasing are available through the Purchasing Management Association of Canada (PMAC) and some post secondary education institutions. For more details on PMAC see the profile Purchasing Agents and Officers (1225).

There are no specific requirements to become a stock clerk, although grade 12 and good computer skills are usually preferred. Training is provided on the job. Those with college courses in business and administration have an advantage.

Dispatchers, radio operators and schedulers usually require grade 12. Police and emergency dispatchers typically are required to complete on-the-job training. Radio operators and police and emergency dispatchers usually require radio operating certificates issued by Industry Canada.

Transportation route and crew schedulers usually require grade 12, plus several years' experience in an appropriate transportation sector.

Desirable qualities for these workers include mathematics and computer skills and good written and oral communication skills. An aptitude for detailed work, an ability to follow instructions and basic analytical skills are important. These workers need to be organized and have good coordination and monitoring skills, and they must be able to keep good records. They need to be able to work as a member of a team.

Working Conditions

Workers in this occupational group work in a wide range of settings. Many work in warehouses or receiving yards, which may be dirty or dusty. Some work in clean and comfortable offices. Others will work in central dispatch centres. Those clerks who are handling goods may have to do some lifting to move goods.

Hours are also extremely varied. Some will work a 35 to 40 hour week, with weekends and evenings off, though many dispatchers will work shifts.

In 1995 these workers earned an average of $25,400 per year. Those who worked full time, full year earned $32,200. Both of these averages are below the all-occupation averages, because many of these jobs are entry-level positions. At the individual occupation level, the average earnings for those in full-time, full-year positions are shown in the following table.

Occupations	**Earnings**
Shippers and Receivers	$29,100
Parts Clerks	$33,400
Production Clerks	$36,200
Purchasing and Inventory	$34,100
Dispatchers	$36,000
Crew Schedulers	$38,800

In all of these occupations, there is a difference in earnings between men and women. The average man earned $27,200, while the average woman earned $21,900. For those who worked full time, full year, the average earnings were $33,900 for men and $28,300 for women.

In a survey of recent college graduates, the average starting salaries for new entrants into these jobs ranged from $1,700 to $2,310 per month ($20,400 to $27,700 per year).

This is a very large occupational group, employing 25,200 people in 1998. This is an increase of 3,390 from the 21,810 workers employed in 1990. There is very little opportunity for self-employment. Because these workers support the processes of a large organization or company, only 2% are self-employed.

Even though only 16% of the workers are in part-time positions, this occupational group still offers over 4,000 part-time work opportunities. Women account for 47% of these part-time positions. About 84% of these workers are full-time employees, with almost 60% of them working full time, full year.

This occupational group has an unemployment rate that is lower than the average for all occupations. Employment in these positions fluctuates according to general economic conditions rather than by season, but retail stores may hire additional staff during the Christmas rush.

Wholesale and retail stores employ 44% of these clerks. They are evenly divided between wholesale and retail. The remainder of the workers are employed by many industries and by government agencies.

Because Vancouver is both a port and a large commercial city, it has many warehouses that distribute incoming goods to their final destinations throughout Canada. Consequently about 68% of these workers live in the Lower Mainland. It is also the manufacturing and wholesale centre for the province. All of the other regions have a smaller share of these workers than the average distribution of the workforce.

About a third of the workers in this occupational group overall are women, which is a lower proportion than the proportion of women in the general workforce (46%). However, women account for about half the number of production clerks, purchasing and inventory clerks, dispatchers and schedulers.

Because the jobs in this occupational group tend to be entry-level positions, these workers are somewhat younger than average for the workforce. About 47% of these workers are under the age of 35, which is a greater share than the average for the workforce (40%). The average age of workers in this occupational group is 37.

Employment Prospects

This is a very large occupational group, made up of about 25,200 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment to grow more slowly than the average for all occupations. Since it is such a large occupational group, there will still be a large number of employment openings. From 1998 to 2008 it is expected that 8,830 positions will become available. Almost two-thirds of these openings will result from replacing retired workers. The remainder will result from growth in the number of new jobs. A high rate of worker turnover (workers leaving for jobs in other fields) will create many additional openings.

There are a number of factors responsible for the low employment growth of this occupational group. Computerized inventory control, ordering systems and scheduling systems will continue to reduce the demand for these workers. In many instances advances in computerized inventory systems have replaced workers. For example, bar code and electronic data interchange (EDI) systems track the flow of goods between warehouses and stores. These systems may then automatically place orders directly with suppliers when inventories are too low. Organizations that utilize these systems no longer require the services of as many workers as previously.

There are a number of occupations within this occupational group, including *shippers* and *receivers*, which make up 50% of this group, *purchasing* and *inventory clerks* (19%), *dispatchers* and *radio operators* (14%), *storekeepers* and *parts clerks* (12%) and *production* and *other related clerks* (5%). Of the 8,830 openings that are expected to become available for this entire occupational group, those openings coming from each of these occupations will be roughly proportional to its relative size.

Often work in this occupational field is considered entry-level. Workers enter with the intention of learning about the industry and then move up to higher level positions. Due to advances in computer technology, however, the skill requirements for workers in this occupational group have increased. Workers with good computer skills stand the best chances of being hired.

Since there are many similarities in the skill requirements of specific jobs in this occupational group, workers may be able to transfer their skills to other areas. There are also many opportunities to specialize within these occupations. The Related Occupations section offers suggestions for other related and more senior occupations open to workers in this group. Additional training and education are required for workers to advance in these positions, but this also offers workers new challenges.

Additional Information

Industry Training and Apprenticeship Commission
http://www.itac.gov.bc.ca/

Related Occupations

- material handlers (in 745 longshore workers and material handlers)
- purchasing agents and officers (1225)
- scheduling technician in manufacturing (in 223 technical occupations in engineering)
- transportation officers and controllers (227)
- retail and wholesale buyers (6233)
- public transit dispatcher (in 722 supervisors, railway and motor transport)

© Stone/Vancouver

2 - NATURAL AND APPLIED SCIENCES AND RELATED OCCUPATIONS

Skill Level A - Professional Occupations

211 Physical Science Professionals 120
2121 Biologists and Related Scientists 125
2122 Forestry Professionals 127
213 Civil, Mechanical, Electrical and Chemical Engineers 130
214 Other Engineers 135
215 Architects, Urban Planners and Land Surveyors 140
2161 Mathematicians, Statisticians and Actuaries 145
2162 Computer Systems Analysts 147
2163 Computer Programmers 150

Skill Level B - Technical, Paraprofessional and Skilled Occupations

221 Technical Occupations in Physical Sciences 153
2221 Biological Technologists and Technicians 157
2223 Forestry Technologists and Technicians 160
2224 Conservation and Fishery Officers 163
2225 Landscape and Horticultural Technicians and Specialists 164
223 Technical Occupations in Civil, Mechanical and Industrial Engineering 167
2241 Electrical and Electronics Engineering Technologists and Technicians 171
2242 Electronic Service Technicians (Household and Business Equipment) 173
2243 Industrial Instrument Technicians and Mechanics 176
2244 Aircraft Instrument, Electrical and Avionics Mechanics, Technicians and Inspectors 178
225 Technical Occupations in Architecture, Drafting, Surveying and Mapping 180
226 Other Technical Inspectors and Regulatory Officers 183
227 Transportation Officers and Controllers 186

Physical Science Professionals

NOC 211

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	2,800	3,060	3,710

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
650	520	1,170

Annual Growth 1998-2008	1.9%
Main Industries of Employment	
Professional Business Services	29%
Fishing and Trapping	23%
Education	11%
Employment by Region	
Lower Mainland	65%
Vancouver Island	22%
Northern B.C.	3%
Okanagan/Kootenay	10%
Self-employment	18%

Nature of the Work

Physicists conduct theoretical and applied research to extend knowledge of natural phenomena. They also develop new processes and devices in fields, such as electronics, communications, power generation and distribution, aerodynamics, optics and lasers, remote sensing, medicine and health. They are employed in a variety of industries, including electronic, electrical and aerospace manufacturing companies, and in computer and telecommunications companies, power utilities, university and government research laboratories, hospitals and a wide range of other processing, manufacturing, research and consulting firms.

Astronomers conduct observational and theoretical research to extend knowledge of the universe. They are employed by government agencies and universities.

Chemists conduct research and analysis in support of industrial operations, product and process development, quality control, environmental control, medical diagnosis and treatment, biotechnology and other applications. They also conduct theoretical, experimental and applied research into basic chemical and biochemical processes in order to create or synthesize new products and processes. Chemists are employed in research, development and quality control laboratories, in chemical, petrochemical and pharmaceutical industries, in mineral, metal, and pulp and paper industries and in a wide variety of manufacturing, utility, health, educational and government establishments.

Geologists, geochemists and *geophysicists* conduct programs of exploration and research to extend knowledge of the structure, composition and processes of the earth and to locate and identify hydrocarbon, mineral and groundwater resources. They also plan and implement programs of hydrocarbon and mineral extraction, and they assess and mitigate the effects of development and waste disposal projects on the environment. They are employed by petroleum and mining companies, by consulting geology, geophysics and engineering firms, and by governments and educational institutions, or they may be self-employed.

Meteorologists analyse and forecast weather, provide consultation on atmospheric phenomena and conduct research into the processes and phenomena of weather, climate and atmosphere. They are employed by the Atmospheric Environment Service of Environment Canada as well as by the military, private consulting companies, resource and utility companies and provincial governments. They also may be self-employed.

This occupational group also includes metallurgists, soil scientists, and physical science occupations that are not elsewhere classified and that involve the conduct of theoretical and applied research in fields of physical science. These professionals are employed by governments, educational institutions and a wide range of industrial establishments.

Main Duties

Physicists design and conduct research in experimental and theoretical physics, carry out analysis of research data and prepare research reports. They also participate in both research and development teams that work on the design and development of experimental, industrial or medical equipment, as well as instrumentation and procedures.

Astronomers design and conduct observational surveys, conduct detailed analyses and develop numerical models to extend knowledge of celestial bodies and radiation received from the component parts of the universe. They also help develop instrumentation and software for astronomical observation and analysis.

Chemists analyse, synthesize, purify, modify and characterize chemical or biochemical compounds. They develop and conduct programs of analysis to ensure quality control of raw materials, chemical intermediates or final products, and they conduct programs of sample and data collection and analysis to identify and quantify environmental toxicants. They also conduct research to develop new chemical formulations and processes and devise new technical applications of industrial chemicals and compounds.

Further, they conduct fundamental and applied research into the synthesis and properties of chemical compounds and the mechanisms of chemical reactions, as well as investigate chemical aspects of the mechanism of drug action, the diagnosis and treatment of disease, organ function and the assessment of health. They participate in interdisciplinary research and development projects, working with chemical engineers, biologists, microbiologists, agronomists, geologists or other professionals. They might also act as technical consultants in a particular field of expertise or supervise other chemists, chemical technicians and technologists.

Geologists, geochemists and *geophysicists* conduct theoretical and applied research to extend knowledge of surface and subsurface features of the earth, its history and the operation of physical, chemical and biological systems that control its evolution. These scientists plan, direct and participate in geological, geochemical and geophysical field studies, drilling and geological testing programs, and seismic, electromagnetic, magnetic, gravimetric, radiometric, radar and other remote sensing programs. They also plan, direct and participate in analysis of geological, geochemical and geophysical survey data, analysis of core samples, drill cuttings and rock samples in order to identify chemical, mineral, hydrocarbon and biological composition, and analysis of well logs, other test results, maps, notes and cross-sections.

They develop applied software for the analysis and interpretation of data. They assess depositional environments and geological age, and they assess the size, orientation and composition of mineral ore bodies and hydrocarbon deposits. They also identify deposits of construction materials and determine their characteristics and suitability for use as concrete aggregates, road fill or other applications. They assess the movement of ground and surface waters, and they advise in areas such as waste management, route and site selection, and the restoration of contaminated sites.

They recommend the acquisition of lands, exploration and mapping programs, and mine development, and they conduct geological and geophysical studies for regional development, site selection and the development of public works projects. They identify and anticipate natural risks, such as slope erosion, landslides, soil instability, subsidence, earthquakes and volcanic eruptions, and they may supervise and coordinate well drilling, completion and work-overs, as well as mining activities.

Meteorologists analyse and interpret data obtained from meteorological stations, radar and satellite imagery and computer model output. They produce weather forecasts, and they act as consultants to the general public, to aviation, marine, farming and forestry industries, and to others engaged in weather sensitive activities. They conduct research into the processes and determinants of atmospheric phenomena, weather, and climate, in part by developing and testing mathematical computer models of weather and climate for experimental or operational use. They also conduct research into the atmospheric dispersion and transport of pollutants, and they develop and use mathematical models of the dispersion and the physical and chemical transformation of pollutants.

Further, they provide consultation on the dispersion, transport and deposition of pollutants for environmental regulation and protection, and they analyse the impact of industrial projects on the climate and quality of the air. They also participate in studies of the effects of weather on the environment, and they provide consultation and advice to outside agencies, professionals, or researchers regarding the use and interpretation of climatological information. Meteorologists also make scientific presentations, and they publish reports, articles or popular texts for specialists, users or the general public. They may engage in the design and development of new equipment and procedures for meteorological data collection, remote sensing or for related applications.

Metallurgists conduct studies into the properties and production of metals and alloys. Soil scientists conduct research into the composition, distribution and evolution of soils. *Materials scientists* conduct research into the properties, composition and production of materials, such as ceramics and composite material.

Example Titles

physicists and astronomers (2111):
- research scientist, physics
- research scientist, electronics
- research scientist, communications
- research scientist, aerospace
- research scientist, remote sensing
- medical physicist
- metrologist
- acoustics physicist
- health physicist
- nuclear physicist
- optics physicist
- plasma physicist
- solid state physicist
- biophysicist
- astrophysicist
- cosmologist
- aerodynamicist
- experimental physicist

chemists (2112):
- clinical chemist
- coatings chemist
- oceanographic chemist
- pharmacological chemist
- organometallic chemist
- theoretical chemist
- environmental chemist
- agricultural chemist
- analytical chemist
- inorganic chemist
- organic chemist
- physical chemist
- quality control chemist
- food chemist
- soil chemist
- polymer chemist
- textile chemist
- electrochemist
- research chemist
- biochemist
- nuclear magnetic resonance (NMR) spectroscopist

- organic mass spectrometrist
- petroleum chemist

geologists, geochemists and geophysicists (2113):

- groundwater geologist
- environmental geologist
- prospecting geologist
- sedimentologist
- paleontologist
- hydrologist
- oceanographer
- mineralogist
- petroleum geologist
- seismologist
- petrologist
- stratigrapher
- glaciologist
- development geologist
- exploration geologist
- mine geologist

meteorologists (2114):

- atmospheric physicist
- weather forecaster
- climatologist
- air quality meteorologist
- hydrometeorologist

other professional occupations in physical sciences (2115):

- ballistics examiner
- materials scientist
- research scientist, ceramics
- research scientist, composite materials
- soil scientist
- physical metallurgist
- metallurgist

Education and Training

Persons in this field generally require at least a bachelor's degree in a relevant discipline, such as physics, astronomy, chemistry, biochemistry, geology, geochemistry, geophysics or meteorology. A master's or a doctoral degree is usually required for physicists, astronomers, geophysicists and research positions, such as research chemist and research meteorologist. Accumulated experience or further education is necessary in order to remain competitive. Familiarity with computer programs relevant to the particular discipline is required.

It also may be necessary to become a registered member of a professional association, such as the Association of Professional Engineers and Geoscientists of British Columbia. Graduates of an accredited educational program become eligible following several years of supervised work experience and successful completion of exams. In some cases, those with a lesser amount of education may become eligible based on a longer period of supervised employment and successful completion of exams.

Many courses in these fields can be completed at B.C. colleges and university colleges and credit received upon entry into an undergraduate program at a university. Both Camosun and Langara College now offer associate degrees in chemistry and physics. All of British Columbia's university colleges now offer bachelor level degrees for some disciplines related to this field. Generally, a four-year bachelor's degree is prerequisite for entry into graduate studies, which usually consist of a two-year master's program followed by a variable-length doctoral (PhD) program. An honours undergraduate degree may be required or recommended in order to enter a graduate program. Often in the physical sciences field two disciplines are combined in the degree program. For example, a degree is obtained in physics and earth science, or in chemistry and oceanography. Further specialization can occur at the master's and doctoral level.

The University of British Columbia (UBC) and the University of Victoria (UVic) both offer bachelor's, master's and doctoral degrees in astronomy, chemistry, engineering, geophysics, oceanography and physics. UBC also offers these three degrees in soil science and geology. UVic's School of Earth and Ocean Sciences offers a bachelor's degree in collaboration with the Department of Physics and Astronomy, and master's and doctoral degrees in earth and ocean sciences. Simon Fraser University offers bachelor's, master's and doctoral degrees in chemistry, biochemistry, mathematics and physics, as well as a bachelor's and a master's degree in earth science. The University of Northern British Columbia offers bachelor's degrees in chemistry and physics.

UBC offers a bachelor's degree in climatology and a one-year diploma in meteorology. Applicants to the meteorology program require a bachelor's degree in a relevant discipline such as physics, applied mathematics or engineering. UBC also offers both a master's and a doctoral degree in hydrology. These degrees are undertaken within another discipline, such as geography or oceanography, following completion of relevant undergraduate courses from a variety of disciplines. A program of undergraduate study in atmospheric science is jointly available through the UBC Departments of Geography and Oceanography, as are a master's and a doctoral degree in this field. Applicants to the master's program in atmospheric science may have a bachelor's degree in a relevant discipline, such as physics, chemistry, mathematics, physical geography or applied science.

All public colleges offer some relevant courses that are eligible for credit upon transfer to first- or second-year university.

For a review of education programs in engineering and mathematics, see the profiles Civil, Mechanical, Electrical and Chemical Engineers (213), Other Engineers (214), and Mathematicians, Statisticians and Actuaries (2161).

Physical science professionals generally require good oral and written communication skills, patience and a curious and inquisitive nature.

Working Conditions

Chemists usually work regular hours in offices and laboratories, although they may do some of their research in a chemical plant or outdoors (for example, while gathering samples of pollutants). Chemists may work in small or large laboratories, and the larger laboratories may incorporate prototype chemical manufacturing facilities as well as advanced equipment. There is a possibility that some chemists may be exposed to health or safety hazards in the handling of certain chemicals, but if proper procedures are followed, there is little risk.

The working conditions of *geoscientists* can be quite varied, with some workers spending most of their time in an office and others spending some of their time in field or laboratory work. *Geologists* may travel frequently to remote field sites by helicopter or other means and cover large areas on foot, whereas *geological* and *physical oceanographers* often have to collect data while at sea. *Exploration geologists* and *geophysicists* often need to relocate as their work requires them to spend time overseas and in remote areas.

Meteorologists often work in weather stations, which are found at airports, in or close to cities, as well as in remote areas. Most of these stations operate 24 hours a day and therefore involve night, weekend and holiday work as well as rotating shifts. Furthermore, operational meteorologists are often faced with forecasting deadlines. Some meteorologists work alone (particularly in smaller, remote weather offices) while others are part of a team. Those meteorologists not doing forecasting usually work in offices and maintain a regular schedule.

Physicists usually work regular hours in offices and/or laboratories, but they may be required to work longer hours if they are intensely involved in their research. In general, the work is not hazardous. Some physicists may spend time working away from home in order to use national or international facilities with unique equipment.

Astronomers who make observations may need to travel and routinely work at night in remote locations where observatories are located.

In 1995 the average annual earnings for all workers in this occupational group were $41,800, with the 91% who worked full time for the whole year receiving $49,600. Those who worked full time, full year as chemists earned the least, at $42,900 per year, and those who worked as meteorologists earned the most, at $55,800 per year. By comparison, the average annual earnings for all occupations in B.C. was $27,900, and the average for those in full-time, full-year positions was $39,400.

The number of employed workers rose from 2,800 in 1990 to 3,060 in 1998. About 28% of this group are geologists, geochemists or geophysicists, 54% are chemists, 9% are physicists and astronomers, 6% are meteorologists, and the balance is made up of a variety of other professional occupations in the physical sciences.

Self-employment for the entire group stands at 18%. By comparison, the rate of self-employment across all occupations in B.C. is 15%. On an individual occupation basis, 33% of geologists, geochemists and geophysicists are self-employed, 9% of physicists and astronomers are self-employed, 8% of chemists are self-employed, and none of the meteorologists report being self-employed. Only 10% of the entire group work part time, compared to the B.C. all-occupation average of 26%.

The rate of unemployment for the entire group is lower than the average for all occupations. However, the category of other professional occupations in the physical sciences has an unemployment rate that is higher than the average for all occupations in B.C.

Physical scientists are employed in a wide range of industries, but the largest concentrations work in professional business services (29%), fishing and trapping (23%), education (11%) and the federal government (8%). About 65% of this group are located in the Lower Mainland, 22% are on Vancouver Island, 10% are in the Okanagan/Kootenay region, and 3% are in Northern B.C.

Women make up only 22% of the entire occupational group. The proportion of women varies across the occupations, with a low of 10% for meteorologists and a high of 32% for chemists. The education levels required for these occupations probably reduce the representation of workers aged 15 to 24 (only 6%) and contribute to an average age (40) that is slightly higher than for all occupations in B.C. (38). About 60% of physical scientists are aged 35 to 54, compared to 49% for the workforce as a whole.

Employment Prospects

This is a medium-sized occupational group, made up of about 3,060 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment in this group to grow at an annual rate of 1.9%, faster than the average for all occupations. For the various occupations contained within this group, a total of 1,170 positions are projected to become available from 1998 to 2008. With the exception of *physicists* and *astronomers*, employment in each of these occupations is also projected to grow faster than the all-occupation average. The combined employment of *physicists* and *astronomers* is projected to grow at a rate close to the all-occupation average.

Over half (630) of the projected openings for this occupational group are projected to become available for *chemists*. Almost one-third (340) are projected to become available for the combined employment of *geologists, geochemists* and *geophysicists*. Only 90 openings are projected for *physicists* and *astronomers* and 70 for *meteorologists*. The few remaining openings are projected to become available for *other professional occupations in physical science*. Most of the openings in each of these occupations are projected to come from growth in the number of new jobs, and the remainder of openings are projected to come from the need to replace workers who retire.

Scientists will be faced with government restraint in funding for research, but technology is opening up many areas for development and industrial use. Any field that has commercial applications will see employment levels rise and will receive private sector support.

Although there are many different types of *chemists*, overall employment prospects are good for these professionals. Growing public concerns over environmental issues, water quality, quality control and occupational health and safety will continue to stimulate the demand for chemists. Communication and information involving quality control in health and the environment, along with national and international consultation, are new areas that could create work for chemists. In addition, those who have acquired extensive experience can direct their careers toward leading projects with junior scientists and groups of technicians. The expertise of chemists is also in demand in the area of chemical sales, where the complexity of products requires representatives who have extensive knowledge of chemistry. Specialists in pharmacology and toxicology are in demand in industrial pharmacy.

Analytical chemists will find more opportunities working on multi-disciplinary teams (with business administrators, engineers, physicists, technicians and computer scientists). Advancement in electronics and computers has caused their work to evolve from traditional chemistry to sophisticated chemistry using computer instruments. The use of robots, currently being introduced in analytical laboratories, will affect chemists who work with hazardous substances, such as toxic products, solvents and radioactive material. Competency in programming these robots is becoming an asset.

Needs in the pharmaceutical industry are creating new research areas in hospitals, research institutes and companies. New technologies are helping clinical *biochemists*, particularly in the development and automation of immunological methods. A new range of simplified, miniature instruments makes it possible to provide the services of a clinical biochemist outside a traditional laboratory.

Employment of *geologists*, *geochemists* and *geophysicists* in B.C. is linked to resource extraction in this province as well as to world-wide demand for geological services. British Columbia is still considered to have a wealth of untapped resources, but the mining industry is not investing heavily in development in the province. Most of the growth opportunities for these specialties are expected to come from strong growth in business services that provide geological services internationally or to local companies involved in international exploration.

Most *meteorologists* are employed in the public sector (over 70% in 1998). Consequently government funding restraints will restrict employment growth in this occupation. What has been traditionally called meteorology is now increasingly referred to as environmental science. This occupation includes jobs that are related to scientific research as well as weather forecasting. An expansion of research into areas such as air pollution, acid rain, the thinning of the ozone layer and weather changes and the resulting biological effects is anticipated. Further, expansion should occur with the development of mathematical models involving chaos theory, applied mathematics and leading-edge informatics. This emphasis on applied research requires that persons entering this field obtain even higher post secondary qualifications, with a doctoral level now expected where previously a master's degree was accepted.

Additional Information

Association of Professional Engineers and Geoscientists of B.C. http://www.apeg.bc.ca

For oceanographers (in NOC 2113 *geologists, geochemists and geophysicists)*
Careers and Jobs in Marine Biology and Oceanography
http://www-marine.stanford.edu/HMSweb/careers.html

Related Occupations

chemists (2112):
- chemical engineers (in 213 civil, mechanical, electrical and chemical engineers)
- molecular biologists (in 2121 biologists)

geologists, geochemists and geophysicists (2113):
- geological engineers (in 214 other engineers)

meteorologists (2114):
- meteorological technicians (in 221 technical occupations in physical sciences)
- announcers who broadcast weather forecasts (in 523 announcers and other broadcasters)

other professional occupations in physical sciences (2115):
- metallurgical and materials engineers (in 214 other engineers)

> ***Needs in the pharmaceutical industry are creating new research areas in hospitals, research institutes and companies. New technologies are helping clinical biochemists, particularly in the development and automation of immunological methods. A new range of simplified, miniature instruments makes it possible to provide the services of a clinical biochemist outside a traditional laboratory.***

Biologists and Related Scientists

NOC 2121

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	2,010	1,800	2,090

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
290	320	610

Annual Growth 1998-2008	1.5%

Main Industries of Employment

Professional Business Services	29%
Education	22%
Provincial and Territorial Administration	13%

Employment by Region

Lower Mainland	48%
Vancouver Island	33%
Northern B.C.	8%
Okanagan/Kootenay	10%

Self-employment	13%

Nature of the Work

Biologists and *related scientists* conduct basic and applied research to extend knowledge of living organisms, manage natural resources and develop new practices and products related to medicine and agriculture. They are employed in both laboratory and field settings by governments, environmental consulting companies, resource and utilities companies, health and educational institutions, and chemical, pharmaceutical and biotechnical companies.

Main Duties

Biologists plan and conduct studies of the environment, including the population, distribution, structure, functional characteristics and behaviour of plants and animals. They conduct ecological and environmental impact studies in order to prepare reports on the potential impacts of new construction projects on newly released areas for resource extraction and on the management of renewable resources. They also study, identify and classify plant and animal specimens and conduct experiments on their growth, heredity and breeding.

Microbiologists and *cell/molecular biologists* conduct research into the structure, function, ecology, biotechnology and genetics of micro-organisms, including bacteria, fungi, protozoans and algae. Another area of research involves the study of the structure and functioning of tissues and cells of humans, animals and plants. They also conduct studies into the identification, effects and control of human, plant and animal pathogens and toxins, and they conduct clinical or laboratory studies to test, evaluate and screen drugs and pharmaceuticals. They also conduct molecular or biochemical studies and experiments into genetic expression, gene manipulation and recombinant DNA technology.

Biologists, microbiologists and *cell/molecular biologists* may supervise biological technologists, technicians and other scientists.

Example Titles

- biologist
- botanist
- zoologist
- ecologist
- bacteriologist
- microbiologist
- immunologist
- anatomist
- toxicologist
- cell biologist
- geneticist
- molecular biologist
- parasitologist
- marine biologist
- embryologist
- histologist
- virologist
- protozoologist
- pharmacologist
- physiologist

©Stone/Vancouver

Education and Training

The minimum requirement for persons employed in this field is a bachelor's degree in a relevant discipline, such as biology, environmental studies or natural resource management. A master's or doctoral degree with a specialization in a particular area is needed for research positions, and post-doctoral research experience is usually required in order to work in an academic department or research institute.

Many courses of study in this field can be taken at B.C. colleges, university colleges and institutes, with credit received upon entry into a bachelor's program at a university. Most of British Columbia's university colleges now offer bachelor level degrees in biology. A four-year bachelor's degree is the usual prerequisite for entry into a graduate program, which generally consists of a two-year master's degree and may be followed by a variable-length doctoral (PhD) program.

The University of Northern British Columbia (UNBC) offers a bachelor's degree in biology, with areas of emphasis in fisheries, plant science and wildlife. The University of British Columbia (UBC) offers bachelor's degrees in biology, microbiology, pharmacology and physiology. The University of Victoria (UVic) offers bachelor's degrees in biology and microbiology. Simon Fraser University (SFU) offers bachelor's degrees in biological science, molecular biology and biochemistry. There are a wide range of study areas possible when completing a biology/biological science degree, such as molecular biology, animal biology, entomology, genetics, marine biology, botany or oceanography.

All four institutions also offer master's and doctoral degrees in these fields. At UBC a biology undergraduate degree is prerequisite for entry into a graduate program within a specific biology field, such as those noted above, whereas at UVic and SFU it qualifies students to pursue a graduate degree in biology with a field of specialization. SFU also offers post-baccalaureate diplomas in various areas of biological science. These programs are for people who have a bachelor's degree in science and wish to upgrade their credentials.

University College of the Cariboo, University College of the Fraser Valley, Okanagan University College and Malaspina University College all offer bachelor level degrees in biology. University College of the Cariboo also offers bachelor's degrees in animal biology, ecology and environmental biology. University College of the Cariboo also offers a full-time, five-year bachelor's degree in natural resource science with a cooperative education option. Some of the courses for this program are available through the Open Learning Agency. This program, designed to impart a general education in this field, qualifies students to enter a master's program at some universities. Okanagan University College offers bachelor's degrees in cell and developmental biology and physiology, while Malaspina University College offers bachelor's degrees in fisheries and aquaculture.

UVic offers a program in environmental studies, but it must be combined with studies in a traditional discipline in order to obtain a degree. UNBC offers a bachelor's and a master's degree in natural resources management with specialization possible in fisheries, forestry or wildlife. UBC offers bachelor's degrees in environmental science, environmental studies and environmental microbiology, as well as master's and doctoral degrees in resource management, to students with undergraduate degrees in relevant disciplines.

UNBC also offers bachelor's and master's degrees in environmental science and environmental studies and a PhD in natural resources and environmental studies. SFU offers a bachelor's degree in environmental science, and master's and doctoral degrees in resource management for those with undergraduate degrees in disciplines related to natural resources. In addition, SFU offers a joint master's degree in natural resource management and business administration for those with an appropriate undergraduate education in both fields, and supervises post-doctoral work as well.

The British Columbia Institute of Technology offers a Bachelor of Technology in Environmental Engineering Technology. Capilano College offers a one-year post-baccalaureate diploma in environmental science for students who already have completed a degree in science and who wish to acquire the knowledge and practical skills necessary for dealing with environmental issues and projects in the workplace.

Biology professionals require a genuine interest in the nature of life, good oral and written communication skills, computer skills and decision-making and problem-solving abilities. Good health and stamina are required for some areas of specialization that require field research. Success in this field is often due to patience and a curious and inquisitive nature. Also needed for success is a willingness to stay up-to-date on environmental regulations and legislation and on technological changes. In some areas of this field environmental awareness is very important.

Working Conditions

Biologists are members of the scientific community of professionals working in B.C. Demand for their services has been driven, in part, by the medical needs of an expanding and aging population. In addition, research in "bio-tech" has begun to capture the imagination of more enterprising biologists, and this field is expected to grow over the long term.

The estimated average annual earnings for all workers in this relatively small occupation in B.C. were $34,000 in 1995, which is higher than the provincial average of $27,900. About 88% of biologists are employed on a full-time, full-year basis, and the average earnings for these full-time, full-year positions was $45,300 in 1995, compared to the all-occupation average of $39,400.

There were 1,800 workers employed as biologists in 1998, which is a small decrease from the 2,010 workers in 1990. Self-employment in this occupation is only slightly less common (at 13%) than is found in the workforce as a whole (15%). Part-time employment among biologists is relatively low. At 11%, it is less than half of the comparable provincial figure for all occupations.

Unemployment for biologists in B.C. is lower than the average for all occupations. Employer demand is mildly sensitive to business conditions, and seasonal factors may be an issue for those biologists working in some segments of the education industry.

About 28% of B.C.'s biologists work in professional business services (for example, environmental consulting). The federal and provincial governments employ 25% of biologists (for example, Department of Fisheries and Oceans, Ministry of the Environment), 22% work in the education field (which includes both research and teaching), and 7% work in hospitals and medical labs.

As with most occupations, the largest concentration of biologists (49%) is in the Lower Mainland. Compared to all occupations, there is a higher proportion of biologists living on Vancouver Island. One-third of the workers live on Vancouver Island, compared to just 18% for all occupations. The Okanagan/Kootenay region has about 11% of B.C.'s biologists, and 8% are employed in Northern B.C.

Women account for 41% of biologists, which is somewhat fewer than the proportion of women in the workforce as a whole (46%). There are fewer workers in the 15 to 24 age group and substantially more in the 25 to 44 age group. This probably reflects the high education requirement. Overall, 70% of biologists are between the ages of 25 and 44, compared to only 53% for workers in all occupations. The average age of biologists is 37.

Employment Prospects

This is a small occupational group, made up of about 1,800 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment for this group to grow at an annual rate of 1.5%, about as fast as the average for all occupations. According to this projection, 610 positions will become available from 1998 to 2008. Slightly more than half of these openings will come from the need to replace workers who retire, and the remainder will come from growth in the number of new jobs.

Approximately one out of four *biologists* worked in the public sector in 1998. Very few new public sector opportunities are expected to become available over the projection period due to a continuing government budget restraint. However, retiring workers will need to be replaced.

Most job opportunities for biologists will be in the private sector, particularly in the professional business services industry. This industry employed almost 30% of all biologists in B.C. in 1998, and its employment is growing faster than the all-industry average.

Industry sources confirm that there is a fundamental shift occurring from purely traditional government employment of biologists to private-sector positions. There is likely to be more growth in private sector research (or joint projects involving both the private sector and government) in traditional fields of biology, as well as growth in bio-tech firms, an increasing number of which are locating in B.C. Individuals entering this field will be looking increasingly at contract and part-time work, as well as self-employment, as project-based work replaces some permanent jobs in government and education.

Additional Information

Careers and Jobs in Marine Biology http://www-marine.stanford.edu/HMSweb/careers.html

Canadian Council for Human Resources in the Environment Industry http://www.cchrei.ca/

BIOTECanada http://www.biotech.ca/

Related Occupations

- biochemists (in 211 physical science professionals)
- specialists in laboratory medicine (in 3111 specialist physicians)

Forestry Professionals

NOC 2122

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	2,370	2,830	2,920

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
90	480	570

Annual Growth 1998-2008	0.3%
Main Industries of Employment	
Logging and Forestry	45%
Professional Business Services	24%
Paper Products Manufacturing	9%
Employment by Region	
Lower Mainland	14%
Vancouver Island	24%
Northern B.C.	35%
Okanagan/Kootenay	27%
Self-employment	16%

Nature of the Work

Forestry professionals conduct research, develop plans and administer and direct programs related to the management and harvesting of forest resources. They are employed by the forest industry, provincial and federal governments, consulting companies, educational institutions and other industries. They may also be self-employed and under contract with one of the agencies just mentioned.

Increasingly, forestry professionals are getting involved in environmental and labour market studies regarding future use of B.C.'s forest lands. Forestry professionals also are becoming more active in helping to develop new products for B.C.'s wood industries.

Main Duties

Forestry professionals plan and direct forest surveys and related studies, prepare reports and recommendations, establish short- and long-term plans for management of forest lands and forest resources, and plan and direct woodlands harvesting, reforestation, silviculture, fire prevention and fire suppression programs, road building, wildlife management, environmental protection and insect/vegetation control programs.

Further, they negotiate terms and conditions of agreements and contracts for forest harvesting, forest management and leasing of forest lands. They monitor contract compliance and results of forestry activities. They ensure adherence to government regulations and company objectives, and they plan and conduct public relations programs, education programs and extension programs related to forestry.

They also develop and oversee programs for tree seedling production and woodlands nursery operations and conduct advanced research in the areas of tree improvement, nursery seedling production, forest soils, forest ecology, forest mensuration, forest operations and other areas. Further, they provide advice and recommendations (on a consultant basis) regarding forestry issues to private woodlot owners, to municipal, provincial or federal governments, and to companies.

Example Titles

- appraisal forester
- consulting forester
- district forester
- forestry superintendent
- professional forester
- forester
- forest engineer
- regional inventory officer-forestry
- registered professional forester (RPF)

©Stone/Vancouver

Education and Training

The minimum requirement for persons employed in this field is usually a bachelor's degree in forestry or in another discipline, such as biology or natural resources, with specialization in forestry or a forestry-related subject. Many people working in forestry are required to be certified by and registered with the Association of B.C. Professional Foresters.

Some courses of study in this field can be completed at B.C. colleges and university colleges, and credit is received upon entry into a bachelor's program at a university. For those who wish to continue their education, a bachelor's degree is the usual prerequisite for entry into a graduate program, which generally consists of a two-year master's degree, and which may be followed by a variable-length doctoral (PhD) program. Admission requirements to university forestry programs generally include completion of grade 12 or equivalent, with a strong background in mathematics, English and sciences.

The University of Northern British Columbia (UNBC) offers bachelor's, master's and doctoral degrees in natural resources management with specialization in forestry. The University of British Columbia's (UBC) Faculty of Forestry offers bachelor's degrees in forestry, science in forestry, wood products processing, and natural resources conservation. UBC also offers master's and doctoral degrees in forestry-related subjects for students with these undergraduate degrees or with bachelor's degrees in related fields, such as agriculture and applied science.

Diplomas in forestry (advanced silviculture) and forestry engineering designed for registered professional foresters are also available at UBC. Students studying at the University of Victoria (UVic) can receive a master's and a doctoral degree in biology with specialization in forest biology, by working with personnel from Forestry Canada or the B.C. Ministry of Forests, through UVic's Centre for Forest Biology. Post-doctoral work can also be undertaken through the Centre.

For additional descriptions of biology and natural resource management programs that could provide appropriate training, see the profile Biologists and Related Scientists (2121).

Professional foresters in British Columbia must be registered with the Association of B.C. Professional Foresters in order to practise. There are primarily two ways to obtain registration. The first way is to complete the Forester-in-Training program. The second way is to complete the Pupil program.

People with a bachelor's degree in forestry or equivalent can take the Forester-in-Training program. They are required to become a member of the Association and work for two years under the supervision of a Professional Forester and to write and pass an examination. The designation of Professional Forester is conferred and registration is issued upon successful completion.

People with a technology diploma in forestry plus two years' forestry experience, or people with four years' forestry experience, can take the Pupil program. They must become members of the Association, complete four years of supervised work experience as well as twenty-six courses, and write and pass an examination. The professional designation of Professional Forester is conferred and registration is then issued.

Forestry professionals require good oral and written communication and computer skills. Management and planning skills are important. Critical thinking, decision-making and problem-solving abilities are required. Good health and stamina are required for field research. Success in this field is often due to patience and a curious and inquisitive scientific nature. In some areas of this field, environmental and political awareness are becoming increasingly important, as are skills in conflict resolution. Continual upgrading of skills and knowledge is generally required.

Working Conditions

The working conditions of *forestry professionals* can vary considerably. Some work regular hours in offices and labs, while others spend a fair amount of physically demanding time outdoors. Workers in this occupation must often perform their duties in all kinds of weather and may be required to put in long hours responding to emergency situations, such as forest fires. Some of the work is solitary, but workers also must be able to deal with loggers, landowners, farmers, ranchers, government officials, special interest groups and the general public on a regular basis.

Forestry professionals in B.C. have seen much more attention being paid to their function over the last ten years. Population growth, international as well as regional environmental concerns and aboriginal land claim issues have focused debate on B.C.'s forests and their uses. Forest-related industries account for the largest export earnings of any industry in B.C.

Based on the 1996 census data, the estimated average earnings for forestry professionals in B.C. were $49,000 in 1995. Over 95% of these workers are employed on a full-time basis, and the majority (67%) work full time for the whole year. The average full-time, full-year earnings for this occupation were $55,300. As a comparison, the average earnings for all occupations in 1995 were $27,900, and the average earnings for full-time, full-year work were $39,400.

Industry sources provide similar statistics. New graduates in forestry from a university, college or technical institute can expect to earn between $36,000 and $58,000 while working under the supervision of a Registered Professional Forester (RPF). Once foresters have completed all of the requirements to become an RPF, the salary range increases to $49,000 to $90,000, with a median salary of $56,000.

Employment levels for forestry professionals were at 2,370 in 1990. By 1998 employment had expanded by 460 to 2,830 workers. With that size, this profession is classified as a medium-sized occupational group.

At 16% self-employment among forestry professionals is about the same as the average for the workforce as a whole (15%). Part-time employment among forestry professionals is just 4%, which is well below the provincial average of 26% for all occupations. The unemployment rate is lower than the average for all occupations. Employer demand is somewhat sensitive to business conditions. Seasonal fluctuations in employment among forestry professionals is also present, although seasonal employment swings are more muted in this group compared to other forestry-related occupations, such as logging.

The largest contingent of forestry professionals work for companies directly involved in forestry and logging (45%) or work for companies in professional business services (24%) including environmental and economic consultants. The wood and paper manufacturing industries employ 15% of forestry professionals, and finally, the provincial government, which owns most of B.C.'s forest lands, employs an additional 9%.

The geographical distribution of employment among forestry professionals does not follow the usual pattern of increased jobs in areas of population concentration. Forestry professionals tend to work in areas of high forestry and logging activity. About 35% of the people in this occupation work in Northern B.C., 27% work in the Okanagan/Kootenay region, 24% work on Vancouver Island, and only 14% work in the Lower Mainland.

Women make up just over 12% of forestry professionals, very much below the 46% provincial average for all occupations. As for the age distribution among forestry professionals, there is a high concentration of workers in the 25 to 44 age group (73%). This compares to only 53% for the workforce as a whole. In addition, only 2% of the workers are in the 15 to 24 age category, which probably reflects the relatively high education requirement. The average age for forestry professionals is 39.

Employment Prospects

This is a medium-sized occupational group, made up of about 2,830 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment for this group to grow at an annual rate of 0.3%, slower than the average for all occupations. According to this projection, 570 positions will become available from 1998 to 2008. Almost all of these openings (84%) will come from the need to replace workers who retire, and the remainder will come from growth in the number of new jobs.

Employment growth of *forestry professionals* in B.C. is linked to the employment growth of the logging and forestry industry. About 45% of these professionals worked in this industry in 1998. According to COPS projections, there will be almost no employment growth in this industry over the projection period.

According to industry sources, fewer but more highly skilled workers will be demanded in the forest industry due to several contributing factors. These factors include global consumer pressures for higher quality and more environmentally responsible forest products. A reduction in the available supply of wood, fibre and wood chips, along with advances and changes in technology, will further reduce overall employment in this industry, particularly for less skilled workers. Global competition, increased U.S. import restrictions imposed by the U.S. softwood lumber agreement, and changing product markets by Asian buyers of coastal B.C. wood will also have a negative impact on the employment of B.C. forestry workers.

The trend towards fewer but more highly skilled workers in the forest industry means that although the total number of workers (and professionals) in this industry may be constant (or declining) over the projection period, the proportion of these positions that are held by forestry professionals may be on the rise. For this reasons, the forestry industry may still be a significant source of employment growth for these professionals, and the COPS forecast may be too pessimistic.

A growing public concern about environmental issues and responsible land management will be a source of employment growth for these professionals. Foresters also will continue to be needed to help landowners manage their forested property.

Government restraint will continue to limit the employment growth in the civil services of forestry professionals. However, the problems facing B.C.'s forestry industry are both long-term and structural in nature, requiring the expertise of experienced forestry professionals over the next decade.

For forestry professionals, mobility to management positions in government and industry is possible with experience. Recruitment methods for this occupation are often by newspaper ads or job postings on the Internet. Forestry professionals who are interested in consulting work will find opportunities through contracts, self-employment or as a member of a business consulting firm.

Additional Information

Association of B.C. Professional foresters
http://www.rpf-bc.org

Related Occupations

- forest and woodlands operations managers (in 01/09 middle and other management)
- forest economists (in 416 policy and program officers, researchers and consultants)
- managers of government forestry policy and program administration (in 01/09 middle and other management)
- managers of research in forestry (in 01/09 middle and other management)

According to industry sources, fewer but more highly skilled workers will be demanded in the forest industry due to several contributing factors. These factors include global consumer pressures for higher quality and more environmentally responsible forest products. A reduction in the available supply of wood, fibre and wood chips, along with advances and changes in technology, will further reduce overall employment in this industry, particularly for less skilled workers.

Civil, Mechanical, Electrical and Chemical Engineers

NOC 213

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	9,240	11,940	15,010

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
3,070	6,410	9,480

Annual Growth 1998-2008	2.3%
Main Industries of Employment	
Professional Business Services	43%
Electrical and Electronic Products	7%
Local and Other Administration	5%
Employment by Region	
Lower Mainland	71%
Vancouver Island	14%
Northern B.C.	6%
Okanagan/Kootenay	9%
Self-employment	12%

Nature of the Work

Civil engineers plan, design, develop and manage projects for the construction or repair of various structures and infrastructures. These include buildings, roads, airports, railways, rapid transit facilities, bridges, dams, ports and coastal installations, and systems related to highway and transportation services, water distribution and sanitation. Civil engineers may also specialize in foundation analysis, building and structural inspection, surveying and municipal planning. Civil engineers are employed by engineering consulting companies, municipal and other levels of government, and in many other industries. They may also be self-employed.

Mechanical engineers research, design and develop machinery and systems for heating, ventilating and air-conditioning, power generation, transportation, processing and manufacturing. They also perform duties related to the evaluation, installation, operation and maintenance of mechanical systems. Mechanical engineers are employed by consulting firms, power generating utilities and in a wide range of manufacturing, processing and transportation industries, or they may be self-employed. Increasingly, the roles mechanical engineers play in large manufacturing companies include major design input to the industrial organization of a plant. Their input is crucial, not only to how the various machines and their supply lines are set up and connected, but also to how the human element (the worker) relates to the machinery and equipment in the production process.

Electrical and *electronics engineers* design, research, evaluate and test electrical and electronic equipment and systems. They are employed by electrical utilities, communications companies, manufacturers of electrical and electronic equipment, computer manufacturers, government, consulting firms and a wide range of manufacturing, processing and transportation industries.

Chemical engineers research, design and develop chemical processes and equipment. They oversee the operation and maintenance of industrial chemical, plastics, pharmaceutical, resource, pulp and food processing plants, and they perform duties related to chemical quality control, environmental protection and biochemical or biotechnical engineering. They are employed in a wide range of manufacturing and processing industries, consulting firms, government agencies, and in research and educational institutions.

©Stone/Vancouver

Main Duties

Civil engineers confer with clients and other members of the engineering team and conduct research to determine project requirements. They plan and design major civil projects, such as buildings, roads, bridges, dams, water and waste management systems, and structural steel fabrications. They develop construction specifications and procedures. They evaluate and recommend appropriate building and construction materials, and they interpret, review and approve survey and civil design work. They also conduct field services for civil works. They ensure construction plans meet guidelines and specifications of building codes and other regulations. They establish and monitor construction work schedules, and they conduct feasibility studies, economic analyses, municipal and regional traffic studies, environmental impact studies and other investigations.

Further, they conduct technical analyses of survey and field data for development of topographic, soil, hydrological or other information. They act as project or site supervisors for land survey or construction work, and they prepare contract documents. They also review and evaluate tenders for construction projects. They supervise technicians, technologists and other engineers, and they review and approve designs, calculations and cost estimates.

Mechanical engineers conduct research into the feasibility, design, operation and performance of mechanisms, components and systems. They prepare material, cost and timing estimates, reports and design specifications for machinery and systems, and they design power plants, machines, components, tools, fixtures and equipment. They supervise and inspect the installation, modification and commissioning of mechanical systems at construction sites or in industrial facilities. They develop maintenance standards, schedules and programs, and they provide guidance to industrial maintenance crews. They also investigate mechanical failures or unexpected maintenance problems, prepare contract documents and evaluate tenders for industrial construction or maintenance. They may also supervise technicians, technologists and other engineers, and they review and approve designs, calculations and cost estimates.

Electrical and *electronics engineers* conduct research into the feasibility, design, operation and performance of electrical generation and distribution networks, electrical machinery and electronic communications, instrumentation and control systems, equipment and components. They prepare material cost and timing estimates, reports and design specifications for electrical and electronic systems and equipment, and they design electrical and electronic circuits, components, systems and equipment.

They also supervise and inspect the installation, modification, testing and operation of electrical and electronic systems and equipment. They develop maintenance and operating standards for electrical and electronic systems and equipment, and they investigate electrical or electronic failures. Further, they develop specialized applications and system software, prepare contract documents and evaluate tenders for construction or maintenance. They may also supervise technicians, technologists, programmers, analysts and other engineers.

Chemical engineers conduct economic and technical feasibility studies in areas related to chemical, petroleum, pulp and paper, food or other processing industries. They conduct research into the development or improvement of chemical engineering processes, reactions and materials, and they evaluate chemical process technology and equipment. They determine production specifications. They design and test chemical processing, along with its associated plants and equipment, and they oversee the construction, modification, operation and maintenance of pilot plants, processing units or processing plants.

They may also establish and conduct quality control programs, operating procedures and control strategies to ensure consistency and adherence to standards for raw materials, products and waste products or emissions. Further, they prepare contract documents and evaluate tenders for the process aspects of industrial construction. They supervise technicians, technologists and other engineers, and they may work in an administrative capacity, for example, in the development of guidelines and specifications for the handling of dangerous chemicals, environmental protection, or standards for foods, materials or consumer goods.

Example Titles

civil engineers (2131):

- environmental engineer
- municipal engineer
- project engineer, construction
- public works engineer
- sanitation engineer
- water management engineer
- highway engineer
- traffic engineer
- bridge engineer
- construction engineer
- hydraulic engineer
- surveying engineer
- transportation engineer
- structural engineer

mechanical engineers (2132):

- acoustics engineer
- design engineer, mechanical
- energy conservation engineer
- engineer, power generation
- fluid mechanics engineer
- heating engineer
- HVAC engineer
- mechanical maintenance engineer
- piping engineer
- thermal design engineer
- nuclear engineer
- tool engineer
- automotive engineer
- refrigeration engineer

electrical and electronics engineers (2133):

- control systems engineer
- design engineer, electrical
- microwave systems engineer
- planning engineer, electrical systems
- process control engineer, electrical
- radio systems engineer
- roadway lighting design engineer
- test engineer, electronics
- transmission planning engineer
- avionics engineer
- network engineer, electrical
- television systems engineer
- telecommunications engineer
- instrumentation and control engineer
- distribution planning engineer, electrical

chemical engineers (2134):

- biochemical engineer
- project engineer, chemical
- adhesives engineer
- chemical process engineer
- industrial hygiene engineer
- industrial waste treatment engineer
- liquid fuels engineer
- petrochemical engineer
- polymer engineer
- process engineer
- waste treatment engineer
- engineer, chemical
- process control engineer, chemical
- refinery engineer
- biotechnical engineer
- chemical engineer, environmental

Education and Training

All persons employed in these areas must have at least a bachelor's degree in a relevant discipline. As well, most are required to register in a professional association. Graduates from an accredited educational program are eligible following four years or more of supervised work experience. Some people, such as surveying engineers, have to pass a qualifying examination as well. An alternate method for those without formal education is to complete a longer period of supervised employment, then pass the necessary exams.

Many courses of study in engineering can be completed at some B.C. colleges and university colleges and credit received upon entry into a bachelor's program at a university. Generally, a four-year undergraduate degree is prerequisite for entry into graduate studies, which usually consist of a two-year master's program followed by a variable-length doctoral (PhD) program.

The University of British Columbia (UBC) offers bachelor's, master's and doctoral degrees in applied science in the areas of bio-resource, chemical, civil, electrical and mechanical engineering. A cooperative education program is also available for the undergraduate engineering program. As well, for people who have a bachelor's degree and some amount of work experience, a master's degree in engineering is available in many of these and other areas.

The University of Victoria offers bachelor's, master's and doctoral degrees in electrical and computer engineering and mechanical engineering. A cooperative education component, which gives students relevant work experience, is mandatory for undergraduate engineering degrees.

Simon Fraser University offers a bachelor's degree in engineering, with specializations in electronics, computer or systems engineering. Also available are master's and doctoral programs in a wide variety of areas for those with an undergraduate degree in an appropriate engineering area. For people who have a bachelor's degree and some amount of work experience, a master's degree in engineering is available, which allows them to upgrade.

Admission requirements to these programs include graduation from grade 12 or equivalent, with a very strong background in mathematics and physics. For specific requirements, see the respective institution's calendar.

People who have completed studies in civil/mechanical/electrical engineering technology may complete a six-month bridging program at Camosun College and enter directly into the third year of an engineering bachelor degree program at a specified university. See Technical Occupations in Civil, Mechanical and Industrial Engineering (223) for more information about engineering technology programs.

Engineers must be comfortable with mathematics and computers. An ability to lead a team is an asset. An understanding of management, economics, product development and marketing, and language skills and some education in the humanities (industrial sociology, psychology) are important as well. Engineers often work in a multidisciplinary environment and acquire knowledge and skills that allow them to practise in associated areas of science, engineering, urban planning, sales, marketing and management.

Working Conditions

Many engineers inspect, oversee and solve on-site problems in laboratories, industrial plants or construction sites. Others may spend much of their time in an office environment. Usually engineers work a standard 40-hour work week, although deadlines may cause added pressure, resulting in longer hours and more stress. Some engineers, such as civil engineers, may work outdoors part of the time. A small number of engineers may travel extensively to plants and construction sites in B.C. and internationally.

In 1995 the average annual earnings for all workers in this occupational group were $47,700, with the 71% who worked full time for the whole year receiving $54,800 on average. The respective all-occupation averages were $27,900 and $39,400. There was not much variation in the average full-time, full-year earnings among these engineers. Civil engineers received the lowest annual average earnings, at $53,300, and chemical engineers earned the highest, at $58,600.

The number of employed workers in this very large occupational group rose from 9,240 in 1990 to 11,940 in 1998. About 38% of this group are civil engineers, 30% are electrical or electronics engineers, 25% are mechanical engineers, and 7% are chemical engineers.

Self-employment for the entire group stands at 12%, but it is lower among chemical engineers (6%). Industry representatives expect self-employment to increase in importance in future years. While 95% of these engineers work at full-time positions, 24% work full time for only part of the year. However, only a small proportion of this occupational group works part time (5%). The unemployment rate for these engineers is lower than the average for all occupations. People in these occupations work in a variety of industries, with the largest concentration (43%) employed in professional business services. Other industries include construction, electric power and telecommunications carriers. The majority (71%) of these workers are located in the Lower Mainland, with 14% on Vancouver Island, 9% in the Okanagan/Kootenay and 6% in Northern B.C.

The occupations in this group remain predominantly male as women still account for only 6% of the workers. The age distribution is much like that for the workforce as a whole, with the exception of the low proportion of engineers in the 15 to 24 age group (3%). This situation reflects the relatively high education requirements. The average age of people in these engineering occupations is slightly higher (41 years) than the B.C. average of 38 years.

Employment Prospects

This is a very large occupational group, made up of about 11,940 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment in this group to grow at an annual rate of 2.3%, faster than the average for all occupations. For the various occupations contained in this group, a total of 9,480 positions are projected to become available from 1998 to 2008. With the exception of *mechanical engineers*, employment in each of these occupations is also projected to grow faster than the all-occupation average. Employment of mechanical engineers is projected to grow at a rate close to the all-occupation average.

Well over one-third of the projected openings for this occupational group, 3,440 in total, are for *civil engineers*. A little over one-third, 3,260 in total, are projected to become available for the combined occupations of *electrical* and *electronics engineers*. Mechanical engineers are projected to account for 2,080 of the total openings for this group, and the remaining 700 openings are projected to become available for *chemical engineers*. Despite the high projected growth in the number of new positions for this entire occupational group, most openings (68%) are projected to result from the need to replace workers who retire.

The professional business services industry is the main employer of these professionals. A little over 40% of these professionals were employed in this industry in 1998. Consequently employment growth in this occupational group is linked to employment growth in this industry, which is also projected to grow faster than the average rate.

It should be noted that industry sources believe that the COPS projections may be overly optimistic. They expect growth in the number of new civil, mechanical, and electrical and electronics engineering jobs to be minimal over the next one to two years.

Growth in the number of civil and mechanical engineers is more closely tied to the expected growth in British Columbia's population base, which generates additional requirements for housing, roads and other infrastructures. In addition, the infrastructure across much of North America needs upgrading, adding to the potential opportunities for business services growth. However, industry sources expect government cutbacks in infrastructure spending (for example, roads and other public resources) to slow employment growth in these professions.

The environment is one of the most promising sectors for civil engineers. Protecting the environment has become a major concern that is triggering new activities and job openings. The treatment of drinking water and the move to reduce industrial waste should result in employment opportunities in environmental protection. Civil engineers are involved extensively in the technical design of water and waste treatment plants, as well as in project management for building and installing equipment and systems to protect the environment. Environmental protection also has considerable potential for employment growth for chemical engineers. This specialization is relatively new and still undergoing development. It is difficult to anticipate the extent of the trend in the future, but it appears promising.

Computer-aided design and manufacturing (CAD/CAM) have freed civil engineers from some of their tasks and enabled them to concentrate on designing projects and managing projects or work teams. Civil engineers are often called upon to administer large-scale projects. Consequently communication skills and interest in team work are major assets for these professionals.

Improvement of computers and communications equipment will continue to be a source of employment growth for *electrical* and *electronics engineers*. The growing demand for electrical and electronic goods will create many additional openings. Since firms are increasingly obtaining electronic engineering expertise from consulting and service firms, most employment growth for these professionals will be in these non-manufacturing firms.

The demand for *avionics engineers* is also expected to rise as new technologies encourage an increase in the number of electronic components on aircraft. The Canadian Airlines Corporation, which was purchased by Air Canada a few months earlier, intends to spend billions to replace 60 to 70 of its aircraft over the following five years. This may stimulate an increase in the amount of resources devoted to the improvement and innovation of new and existing avionics technologies.

Most *mechanical engineers* are employed by consulting engineering and manufacturing firms. The aeronautics industry will also be a source of employment growth for mechanical engineers because of the need to replace the current aging fleet of aircraft. In the pulp and paper industry most jobs will be in the area of pollution prevention because firms must comply with strict environmental standards. The employment level of engineers who specialize in heating, ventilation or air-conditioning will be cyclical since it is related to construction trends and consequently to construction investment and economic fluctuations in general.

New technologies are changing the duties of mechanical engineers. Firms need professionals who are familiar with robotics and process automation in order to optimize the operation of systems with regard to cost, maintenance and labour needs. The challenges facing mechanical engineers include, choosing the best tools, automating production lines and increasing the effectiveness of production methods. They must be able to come up with ideas and have good critical judgment.

Mechanical engineers can also direct their careers toward jobs as technical equipment representatives or managers in an industrial company.

COPS projections for *chemical engineers* have to be treated with some degree of caution. A significant number of chemical engineers working in British Columbia are currently employed in the pulp and paper industry. This industry is not expected to expand production capacity but will be shifting to environmental issues. Some chemical engineers work as part of development project teams for international projects, where there is a better employment outlook but also considerable competition from experienced engineers. Generally, growth in the chemical engineering field is related to advances in bio-technology research, as well as in synthetic products, including plastics. The bio-technology field is expected by some to become the "next computer industry." This means that it could be a sector with fundamental and enabling impacts on virtually all other industries. Significant growth in bio-tech research and applications could yield an additional boost to chemical engineering employment prospects.

Although industry sources expect minimal new job growth, they also have also indicated that the current number of *electrical* and *electronics* and *mechanical engineer* graduates are insufficient to meet the demand for their services. Consequently there is a shortage of these professionals, and their employment prospects are good.

Rapid advances in technology make it necessary for all engineers in this occupational group to keep up-to-date constantly with new developments in their areas of specialty.

Consulting firms are particularly interested in candidates who have a master's degree in some form of environmental studies. Engineering is a discipline that is attracting a growing number of international contracts. However, engineers who would like to work in international consulting must acquire a good professional reputation and be able to adapt to different cultures. Consulting firms also recruit consultants who have extensive experience in project management and are capable of leading a project team.

Additional Information

Association of Professional Engineers and Geoscientists of B.C. http://www.apeg.bc.ca

Related Occupations

civil engineers (2131):

- engineering managers (in 01/09 middle and other management)
- geological engineers (in 214 other engineers)

mechanical engineers (2132):
- marine engineering officers (in 227 transportation officers and controllers)
- power engineers or stationary engineers (in 735 stationary engineers and power station and system operators)

electrical and electronics engineers (2133):
- computer engineers (in 214 other engineers)
- computer systems analysts (2162)
- aerospace systems engineers (in 214 other engineers)
- software engineers (in 214 other engineers)

chemical engineers (2134):
- chemists (in 211 physical science professionals)
- metallurgical and materials engineers (in 214 other engineers)
- petroleum engineers (in 214 other engineers)
- food processing engineers (in 214 other engineers)
- biomedical engineers (in 214 other engineers)

Other Engineers

NOC 214

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	3,110	5,340	6,790

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
1,450	700	2,150

Annual Growth 1998-2008 2.4%

Main Industries of Employment

Professional Business Services	23%
Other Business Services	23%
Hospitals	6%

Employment by Region

Lower Mainland	67%
Vancouver Island	16%
Northern B.C.	6%
Okanagan/Kootenay	11%

Self-employment 13%

Nature of the Work

This group of other engineers includes engineers other than those working in civil, mechanical, electrical or chemical engineering. In addition to the main industries of employment listed above, these professionals are also employed in consulting engineering firms, government, research and educational institutions.

Industrial and *manufacturing engineers* conduct studies and develop and supervise programs to achieve efficient industrial production and efficient utilization of industrial human resources, machinery and materials. Industrial and manufacturing engineers are employed in manufacturing and processing companies and in financial, health care and other institutions.

Metallurgical and *materials engineers* conduct studies of the properties and characteristics of metals and other non-metallic materials, and they plan, design and develop machinery and processes to concentrate, extract, refine and process metals, alloys and other materials such as ceramics, semiconductors and composite materials. Metallurgical and materials engineers are employed in mining, metal processing and manufacturing companies.

Mining engineers plan and design the development of mines and mine facilities, systems and equipment, and they plan, organize and supervise the extraction of metallic or non-metallic minerals and ores from underground or surface mines. Mining engineers are employed by mining companies and manufacturers.

Geological engineers conduct studies to analyse geological and geotechnical conditions for civil engineering, mining, and oil and gas projects, and they plan, design, develop and supervise programs of geological data acquisition and analysis and the preparation of geological engineering reports and recommendations. Geological engineers are employed in electrical utilities, mining and petroleum companies.

Petroleum engineers conduct studies related to the exploration, development and extraction of oil and gas deposits. They plan, design, develop and supervise projects for the drilling, completion, testing and re-working of oil and gas wells, and they conduct analyses of oil and gas reserves and production potential. Petroleum engineers are employed by petroleum producing, well logging or testing companies.

Aerospace engineers research, design and develop aircraft, spacecraft, missiles, aerospace systems and their components, and perform duties related to the testing, evaluation, installation, operation and maintenance of aerospace vehicles and systems. Aerospace engineers are employed by aircraft and spacecraft manufacturers and air transport carriers.

Computer engineers research, plan, design, develop and test computers and related equipment, and they design and develop software for engineering and industrial applications. Computer *hardware engineers* are employed by computer manufacturers and a range of peripheral industries. They are involved in the design and upgrading of mother boards, chip controllers and peripherals, such as audio and video cards for computers. *Software engineers* are employed by companies that manufacture and market software products, by companies that devise embedded software for inclusion in other products, such as computers, telecommunications equipment and networks, aerospace products and instrumentation and control products, and by consulting companies that provide software-related information technology services.

This group also includes agricultural engineers, biomedical engineers, engineering physicists, engineering scientists, food processing engineers, marine and naval engineers, textile engineers and other specialized engineering occupations that are not classified elsewhere.

Main Duties

Industrial and *manufacturing engineers* plan and design plant layouts and facilities, study new machinery and facilities, and recommend or select efficient combinations. They develop flexible or integrated manufacturing systems and procedures. They conduct studies and implement programs to determine optimum inventory levels for production and to allow optimum utilization of machinery, materials and resources. They analyse costs of production, and they design, develop and conduct time studies and work simplification programs.

They also determine human resource and skill requirements. They develop training programs, performance standards, evaluation systems, and wage and incentive programs, and they conduct studies of the reliability and performance of plant facilities and of production or administrative systems. Further, they establish programs and conduct studies to enhance industrial health and safety or to identify and correct fire and other hazards. They valuate or assess industrial facilities, and they supervise technicians, technologists, analysts, administrative staff and other engineers.

Metallurgical and *materials engineers* conduct studies and design, develop and specify the processes and machinery needed to concentrate, extract, refine and process metals from ores. They conduct studies on the properties and characteristics of materials. They design, develop and specify processes for moulding, shaping, forming and conducting thermal treatment of metals, alloys and metallic systems, ceramics, semiconducting and other materials, and they conduct chemical and physical analytical studies, failure analyses and other studies. They also recommend material selection, design of materials, corrosion control measures, operational testing and other procedures. They coordinate production testing and control of metal refining, smelting or foundry operations or non-metallic materials production operations, and they supervise technologists, technicians and other engineers and scientists.

Mining engineers conduct preliminary surveys and studies of ore, mineral or coal deposits to assess the economic and environmental feasibility of potential mining operations. They determine the appropriate means of safely and efficiently mining deposits, and they determine and advise on appropriate drilling and blasting methods for mining, construction or demolition. They design shafts, ventilation systems, mine services, haulage systems and supporting structures. They design, develop and implement computer applications, such as those for mine design, mine modelling, mapping or monitoring mine conditions, and they plan and design or select mining equipment and machinery and mineral treatment machinery and equipment in collaboration with other engineering specialists.

They also plan, organize and supervise the development of mines and mine structures and the operation and maintenance of mines. They prepare operations and project estimates, schedules and reports. They implement and coordinate mine safety programs, and they supervise and coordinate the work of technicians, technologists, survey personnel and other engineers and scientists.

Geological engineers plan, develop and coordinate programs of geotechnical, geological, geophysical or geohydrological data acquisition, analysis and mapping to assist in the development of civil engineering, mining, petroleum and waste management projects or for regional development. They analyse and prepare recommendations and reports for construction or improvements to foundations of civil engineering projects, such as rock excavation, pressure grouting, rock slope stabilization and hydraulic channel erosion control. They conduct theoretical and applied study of groundwater flow and contamination, and they develop prescriptions for site selection, treatment and construction.

They also plan, develop, coordinate and conduct theoretical and experimental studies in mining exploration, mine evaluation and feasibility studies relative to the mining industry. They conduct surveys and studies of ore deposits, ore reserve calculations and mine design. They design, develop and implement computer applications for geophysics, geochemistry, geology, mapping and related fields, and they supervise technologists, technicians and other engineers and scientists.

Petroleum engineers direct and monitor oil and gas drilling operations, develop drilling programs, select sites, and specify drilling fluids, bit selection, drill stem testing procedures and equipment. They direct and monitor the completion and evaluation of wells, well testing and well surveys. They design and select artificial lift machinery, and well and surface production equipment and systems, and they specify programs for corrosion control and oil or gas treatment.

They also develop specifications for oil and gas recovery and monitor and supervise well modification and stimulation programs to maximize oil and gas recovery. They analyse reservoir rock and fluid data to design optimum recovery methods and to predict reservoir performance and reserves, and they monitor oil and gas reservoir performance and conduct technical and economic analyses to recommend improved production methods. Further, they design, develop and coordinate the installation, maintenance and operation of subsea well-head and production equipment.

Aerospace engineers design and develop aerospace vehicles, systems and components, develop and conduct computer simulations of aerospace vehicles, systems and components, and prepare specifications for materials and processes to be used in aerospace manufacturing, maintenance, repair or modification. They supervise and coordinate the manufacturing, assembly modification, repair and overhaul of aircraft and spacecraft. They coordinate ground and flight tests of air and spacecraft, and they develop operational specifications, maintenance schedules and manuals for operators. They also develop the technical phases of logistical and operational support for aerospace vehicles and systems, and they investigate and report on structural or other component or system failures, accidents or incidents and prepare recommendations for corrective action.

Computer engineers plan, design and coordinate the development of computers and related equipment, supervise and inspect the installation, modification and testing of computers and related equipment, and supervise drafters, technicians, technologists and other engineers. They analyse the requirements for the application of computer technology in real-time environments for process or machine control, instrumentation, robotics, telecommunications, environmental monitoring, remote sensing, medical and related engineering, scientific and industrial applications. They also design and develop or coordinate the development, testing and implementation of computer languages and computer software packages, and they supervise the work of programmers, technologists, technicians and other engineering and scientific personnel.

Agricultural engineers study and advise on engineering problems related to agriculture and design agricultural machinery, structures, equipment and systems.

Biomedical engineers design and develop medical diagnostic and clinical instrumentation, equipment and procedures. They develop devices to assist the disabled. They advise hospital administrators on planning, acquisition and use of medical equipment, and they modify and install or supervise installation of equipment.

Engineering physicists and *engineering scientists* conduct research and develop processes, programs and equipment to expand fundamental knowledge in the applied sciences and engineering and to support advanced engineering and scientific applications.

Food processing engineers design and develop processes, equipment and procedures for the processing, storage, packaging and handling of food products.

Marine and *naval engineers* design and develop marine vessels, floating structures and associated marine power plants, propulsion systems and related systems and equipment, and oversee the building, maintenance and repair of vessels and marine systems.

Textile engineers design and develop processes, equipment and procedures for the production of fibres, yarns and textiles.

Example Titles

industrial and manufacturing engineers (2141):
- cost engineer
- engineer, computer integrated manufacturing
- fire prevention engineer
- plant engineer
- work measurement engineer
- methods engineer
- quality control engineer
- safety engineer
- production engineer
- time-study engineer
- optical engineer

metallurgical and materials engineers (2142):
- extractive metallurgist
- hydrometallurgist
- pyrometallurgist
- electrometallurgical engineer
- foundry engineer
- physical metallurgical engineer
- corrosion engineer
- ceramics engineer
- hydrometallurgical engineer
- pyrometallurgical engineer

mining engineers (2143):
- mine ventilation engineer
- mine safety engineer
- mine production engineer
- mine design engineer
- mine development engineer
- mine layout engineer
- mineral engineer

geological engineers (2144):
- hydrogeological engineer
- engineering geologist
- geophysical engineer

petroleum engineers (2145):
- petroleum engineer, completion
- drilling engineer, oil and gas
- production engineer, oil and gas
- subsea engineer

reservoir engineer, petroleum
- *aerospace engineers (2146)*:
- systems engineer, aerospace
- aerodynamics engineer
- aircraft design engineer
- stress engineer, aerospace
- structural engineer, aerospace
- test engineer, aerospace
- aeronautical engineer

computer engineers (2147):
- software engineer
- hardware engineer
- computer applications engineer
- systems design engineer
- systems engineer

other professional engineers, not elsewhere classified (2148):
- food processing engineer
- clinical engineer
- biomedical engineer
- agricultural engineer
- naval engineer
- apprentice marine engineer
- marine engineer
- naval architect
- engineering physicist

- textile engineer
- engineering scientist

Education and Training

All persons employed in these areas must have at least a bachelor's degree in a relevant discipline, such as engineering physics, computer science, or metallurgical, materials, ceramic, mining, geological, petroleum, aerospace or computer engineering. As well, most are required to register in a professional association. Graduates from an accredited educational program are eligible following two years or more of supervised work experience. An alternative method for those without formal education is to complete a longer period of supervised employment, then pass the necessary exams.

Many courses of study in engineering can be completed at some B.C. colleges and university colleges, and credit received upon entry into a bachelor's program at a university. Generally, a four-year undergraduate degree is prerequisite for entry into graduate studies, which usually consist of a two-year master's program followed by a variable-length doctoral (PhD) program. Camosun College offers a 30-month Computer Engineering Technology Diploma program. This diploma prepares graduates for employment as computer aided designers and in instrumentation and data acquisition. Admission requires math 12, English 12 or equivalent, and applied physics 12 is strongly recommended. Camosun also offers a Computer Engineering Bridging Program designed to provide Camosun's Engineering Diploma graduates with entry into the third year of the Bachelor of Engineering Degree at the University of Victoria (UVic).

Technical University of British Columbia offers a Bachelor of Science (Information Technology) Degree. Students can concentrate on one of four options. These are, software systems, software engineering, computer systems engineering and telecommunications engineering.

The University of British Columbia (UBC) offers bachelor's, master's and doctoral degrees in applied science in the areas of geological engineering, metals and materials engineering, mining and mineral processing engineering, and engineering physics. UBC also offers a naval architecture option within a bachelor's degree program in mechanical engineering. As well, graduate study in bio-medical engineering is possible, following appropriate undergraduate education within other engineering areas through several university departments and affiliated teaching hospitals. For people who have a bachelor's degree and some amount of work experience, a master's degree in engineering is available in many of these areas.

UVic offers bachelor's, master's and doctoral degrees in computer engineering. A cooperative education component, which gives students relevant work experience, is mandatory for the undergraduate degree.

Simon Fraser University offers a bachelor's degree in applied science, with specializations in computer engineering and engineering physics. Also available are master's and doctoral programs in applied science, with specialization in a wide variety of areas, including biomedical engineering. For people who have a bachelor's degree and some amount of work experience, a master's degree in engineering is available.

Engineers must be comfortable with mathematics and computers. An ability to lead a team is an asset. An understanding of management, economics, product development and marketing, and language skills and some education in the humanities (industrial sociology, psychology) are important as well. Engineers often work in a multidisciplinary environment and acquire knowledge and skills through work experience that allows them to practise in associated areas of science, engineering, urban planning, sales, marketing and management.

Working Conditions

The engineers in this occupational group work in a variety of settings under a wide range of conditions and have varied working hours.

In 1995 the average annual earnings for all workers in this occupational group were $46,700. Full-time, full-year engineers earned $55,100. The respective all-occupation averages for 1995 were $27,900 and $39,400. Average earnings were higher among petroleum engineers, at $53,500 ($70,300 among those working full time, full year) and mining engineers, at $53,000 ($62,700 for those working full time, full year). Average earnings were lower among aerospace engineers, at $40,100 ($46,800 for those working full time, full year).

The number of employed workers in this group rose from 3,110 in 1990 to 5,340 in 1998. Computer engineers are the largest occupation within this group. They represent 39% of all these engineers, and the increase in their numbers (1,070 workers) accounts for almost half of this group's growth. The increased demand for computer engineers reflects the growth in B.C.'s high tech field. Other occupations in this group that represent a significant number of those employed are mining engineers (13%), industrial and manufacturing engineers (9%) and professional engineers not elsewhere classified, such as agricultural, biomedical, marine or textile engineers (20%).

Self-employment for the entire group stands at 13%, but there is some variation between specific occupations. About 11% of computer engineers are self-employed, while 19% of mining engineers work for themselves. By comparison, the rate of self-employment across all occupations in B.C. is 15%.

As is often the case in professional occupations, the proportion of this group who are employed part time (6%) is much lower than the average for the workforce as a whole (26%). While 94% of the workers are employed on a full-time basis, 68% work full time for the whole year, and 26% work full time for part of the year. Unemployment for the entire group is also lower than the average for all occupations. However, among petroleum engineers and professional engineers not elsewhere classified, the unemployment rate is about the same as the average for all occupations.

Given the diversity of occupations within this group, it comes as no surprise that they are found in a very wide range of industries. The largest concentrations are employed in professional engineering business services (23%), other business services (22%), electric and electronic products (6%), services incidental to mining (6%) and hospitals (6%).

The proportion of this group in the Lower Mainland is higher (67%) than the average occupational representation for that region (57%). About 16% of these workers are located on Vancouver Island, 11% are in the Okanagan/Kootenay, and 6% are in Northern B.C.

This occupational group remains overwhelmingly male, with women accounting for only 10% of the workers. There are fewer engineers aged 15 to 24 (4%) than in the workforce as a whole (15%). This is not unusual for professional occupations as they generally require a higher level of education and training. In addition, there are a larger proportion of workers in the 25 to 44 age range (67%), compared to all occupations (53%). The average age for these engineers is 39.

Employment Prospects

This is a large occupational group, made up of about 5,340 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment in this group to grow at an annual rate of 2.4%, much faster than the average for all occupations. According to this projection, a total of 2,150 positions will become available from 1998 to 2008. Slightly over two-thirds of these openings are projected to result from growth in the number of new positions, and the remainder will come from the need to replace workers who retire.

Computer engineering is by far the largest occupation within this occupational group. Employment of these professionals is growing much faster than the all-occupation average and significantly faster than any other occupation in this group. Almost half (49%) of the projected openings are for these professionals. *Other professional engineers* (see example titles for examples of occupations under this heading) is the next largest group and is only about half the size of the computer engineer group. These other professionals account for 19% of the projected openings. The three occupations of *industrial* and *manufacturing engineers*, *mining engineers*, and *geological engineers* each account for a little less than 10% of the openings projected for this entire occupational group. *Petroleum engineers, aerospace engineers*, and *metallurgical* and *materials engineers* account for the remaining 8% of the projected openings.

The *computer engineering* field has a very positive employment outlook for those with the right set of skills. In particular, more and more companies in the Lower Mainland are involved in the engineering of mother boards, sound cards and other computer peripherals. Many of these companies are also expanding their trading and manufacturing relationships with computer companies in Asia. These developments will lead to increased employment opportunities for computer engineers.

According to industry sources, there is a current shortage of qualified computer engineers because Canadian schools are not producing enough graduates to fill openings in this field. To compensate for this shortage, the federal government temporarily has relaxed immigration requirements for foreign computer engineers who have received job offers from Canadian firms.

Industry sources also indicate that computer engineers often switch jobs in order to work for employers who offer to pay higher wages. This creates even more job openings and makes it even easier for qualified graduates to penetrate the job market.

An example of an *industrial* and *manufacturing engineer* would be an *optical engineer*. According to industry sources these professionals are currently in very high demand and there are simply not enough optical engineers to satisfy the demand for their services. The growing use of fibre optics to transfer data over the Internet over the last three to four years is largely responsible for their high demand. Fibre optics enables the transmission of information along glass fibres using photons (particles of light). These fibres can be as thin as a hair and transmit more information and at a much faster speed than a more traditional electronic system.

The combined employment of the three occupations of *metallurgical* and *materials engineers*, *mining engineers*, and *geological engineers* is projected to grow at a rate close to the all-occupation average through to the year 2008. However, the actual employment growth rate that these professionals will experience depends on the answers to the following two questions. First, will the overall economic growth rate in North America and Asia stimulate mining in general, and second, will the trend of more B.C. companies shifting operations to South America (for example, Chile) continue and/or accelerate? British Columbia still has plentiful reserves of several types of ore. However, ore deposits in B.C. are often not as pure as they are in countries that have a lower extraction cost. In addition, mining and geological engineers, who mostly work in the business consulting sector in B.C., often find that they are involved in contract work developing offshore mines.

Employment of *aerospace engineers* is forecast to grow faster than the all-occupation average through to the year 2008. The Canadian Airlines Corporation, which was purchased by Air Canada a few months earlier, intends to spend billions to replace 60 to 70 of its aircraft over the following five years. This may stimulate an increase in the amount of resources devoted towards the improvement and innovation of new and existing avionics and aerospace technologies. This increase would require the services of aerospace engineers, which potentially could be a large source of employment growth for these professionals.

Additional Information

For *software engineers*, the Canadian Council of Professional Engineers http://www.ccpe.ca/

Software Human Resource Council http://www.shrc.ca/

For more information on computer-related occupations, see the *Information Technology Occupations* section in the *Introduction to Work Futures.*

Related Occupations

industrial and manufacturing engineers (2141):
- organizational analysts (in 1122 management and advertising consultants)

metallurgical and materials engineers (2142):
- chemical engineers (in 213 civil, mechanical, electrical and chemical engineers)
- chemists (in 211 physical science professionals)
- physical metallurgists and materials scientists (in 211 physical science professionals)

mining engineers (2143):
- geologists, geochemists and geophysicists (in 211 physical science professionals)
- mine managers (in 01/09 middle and other management)

geological engineers (2144):
- geologists, geochemists and geophysicists (in 211 physical science professionals)

petroleum engineers (2145):
- chemical engineers (in 213 civil, mechanical, electrical and chemical engineers)
- geologists, geochemists and geophysicists (in 211 physical science professionals)
- supervisors, oil and gas drilling and service (in 822 supervisors, mining, oil and gas)

aerospace engineers (2146):
- aircraft maintenance engineers (in 731 machinery and transportation equipment mechanics)
- aircraft maintenance engineers, avionics (in 2244 aircraft instrument, electrical and avionics mechanics, technicians and inspectors)

computer engineers (2147):
- computer systems analysts (2162)
- computer programmers (2163)
- electrical and electronics engineers (in 213 civil, mechanical, electrical and chemical engineers)
- engineering managers (in 01/09 middle and other management)
- technical sales specialists, wholesale trade (6221)

other professional engineers, not elsewhere classified (2148):
- biochemical engineers (in 213 civil, mechanical, electrical and chemical engineers)
- marine engineer officers - water transport (in 227 transportation officers and controllers)
- physicists (in 211 physical science professionals)

Architects, Urban Planners and Land Surveyors

NOC 215

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	4,520	3,950	4,730

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
780	910	1,690

Annual Growth 1998-2008 1.8%

Main Industries of Employment

Professional Business Services	66%
Local and Other Administration	17%
Construction	7%

Employment by Region

Lower Mainland	67%
Vancouver Island	17%
Northern B.C.	4%
Okanagan/Kootenay	11%

Self-employment 34%

Nature of the Work

Architects conceptualize, plan and develop designs for the construction and renovation of commercial, institutional, industrial and residential buildings and other structures. They coordinate and administer many aspects of construction, including field review and inspection, and they prepare contracts and various other documents. Architects are employed by architectural firms, private corporations and governments, or they may be self-employed.

Landscape architects conceptualize landscape designs, develop contract documents, and oversee the construction of landscape development for commercial projects, office complexes, parks, golf courses and residential developments. They are employed by architectural and engineering firms, landscape consulting firms, landscape contractors and by government, environmental and development agencies, or they may be self-employed.

Urban and *land use planners* develop plans and recommend policies for managing the use of land, physical facilities and associated services for urban and rural areas and remote regions. They are employed by land developers, engineering and other consulting companies, and all levels of government, or they may work as private consultants.

Land surveyors plan, direct and conduct legal surveys to establish and maintain real property boundaries and prepare official plans, records and documents pertaining to these surveys. They are employed by federal, provincial and municipal governments, and by private sector land surveying establishments, or they may be self-employed.

Main Duties

Architects consult with clients to determine the feasibility, type, style and purpose of renovations or new building construction being considered. They conceptualize functional relationships, design buildings and develop plans that describe design, function, specifications, building materials and costs. They also coordinate and integrate construction schedules, prepare sketches and models for clients, and prepare or supervise the preparation of contracts, drawings and specifications for costing and bidding by contractors and tradepersons.

Further, they work with contractors and other personnel involved with construction. They conduct inspections of construction sites to substantiate compliance with drawings, specifications and codes, and they certify performance and payment. They may also conduct feasibility studies and financial analyses of building projects.

Landscape architects confer with clients to determine design needs. They survey and assess designated sites, and they develop designs taking into consideration landscape features, buildings, climate, future usage and other aspects. They prepare or oversee the preparation of detailed drawings for sites, including features, such as trees, shrubs, gardens, lighting, walkways, patios, decks, benches, fences, retaining walls and fountains.

They also prepare or oversee preparation of site plans, reports, sketches, models, photographs, maps, land use studies and design plans. Further, they estimate costs, prepare specifications and evaluate tenders for landscape construction projects, and they conduct environmental design studies, including environmental assessment, planning and the preservation and re-creation of historical sites. They may also manage and supervise landscape construction work.

Urban and *land use planners* compile and analyse data on demographic, economic, legal, political, cultural, sociological, physical and other factors affecting land use. They confer with municipal, provincial and federal authorities, civic leaders, social scientists, lawyers, land developers, the public and special interest groups to formulate and develop land use or community plans. Further, they prepare and recommend land development concepts and plans for zoning, subdivisions, transportation, public utilities, community facilities, parks, agricultural and other land uses, and they prepare plans for environmental protection, such as wildlife preserves, national and provincial parks and protection of watersheds.

They also present plans to civic, rural and regional authorities and hold public meetings to present plans, proposals or planning studies to the general public and special interest groups. They review and evaluate proposals for land use and development plans and prepare recommendations. They process applications for land development permits. They administer land use plans and zoning by-laws, and they formulate long range objectives and policies relative to future land use and the protection of the environment. In addition, they supervise and coordinate the work of urban planning technicians and technologists.

Land surveyors develop survey plans, methods and procedures for legal surveys, mapping and control for land information systems. They plan, direct and supervise or conduct surveys to establish legal boundaries of properties, parcels of lands, subdivision of lands for rural and urban development, utility rights-of-way, roadways and highways, and they record all measurements and other information obtained during survey activities.

They also prepare or supervise the preparation and compilation of all data, plans, charts, descriptions, records and documents related to surveys of real property boundaries. They certify and assume liability for surveys made to establish real property boundaries, and they advise and provide consultation on matters related to cadastral surveys, geographic, topographic and engineering surveying and building location certificates.

©Stone/Vancouver

Example Titles

architects (2151):

- chief architect
- project architect
- architectural standards specialist
- consulting architect
- industrial and commercial buildings architect
- residential architect

landscape architects (2152):

- architect, landscape

urban and land use planners (2153):

- community and urban planner
- environment planner
- recreation planner
- city planner
- land use planner
- municipal planner
- regional planner
- urban planner
- long range planner
- planner
- planning analyst
- park planner

land surveyor (2154):

- commissioned land surveyor
- provincial land surveyor
- legal surveyor
- property surveyor
- professional land surveyor

Education and Training

There are two ways to become an *architect*. The first involves obtaining a bachelor's degree in architecture, followed by three years of work experience under the supervision of a registered architect, then completion of examinations to receive certification granted by the Canadian Architectural Certification Board. The second involves completion of a syllabus of studies provided by the Royal Architectural Institute of Canada, combined with on-the-job training under the supervision of a registered architect during part of the program, then passing the exams.

Students entering the syllabus program with no prior experience and training usually require about ten years of part-time (15 to 30 hours a week) study to complete the academic requirements. Completion of grade 12, with strong math and English skills, is prerequisite to the syllabus program. Certified architects become members of the Royal Architectural Institute of Canada. A master's degree may be required for some positions.

Acceptance into the School of Architecture at the University of British Columbia (UBC) generally requires completion of a bachelor's degree with high standing, although this condition may be waived for designers with advanced artistic achievement. The School favours applicants who have acquired a broad university education, with courses in subject areas, such as mathematics, physics, English literature and composition, architectural history and design-oriented subjects with emphasis on visual communication. A three-year master's degree is offered (which replaces the bachelor's degree previously offered) and a post-professional degree in advanced studies in architecture is also available.

Architects need to be creative and imaginative, able to visualize space relationships in three dimensions, have a concern for detail and accuracy, and be organized and self-motivated. They must be able to work well with others, and they require good communication and leadership skills. They should be comfortable working with computers, be able to handle pressure of deadlines, be able to accept criticism, and have problem-solving abilities. Many successful people in this field have an interest in mathematics, physics, history, art and environmental issues. Some knowledge of business and marketing is necessary for those who are self-employed, and management skills are useful. Work as an architect can involve international travel. The study of other languages may enhance these opportunities.

Landscape architects require a bachelor's degree in landscape architecture, and a master's degree may be required for some positions. Graduates may apply to be an associate member of the B.C. Society of Landscape Architects. Following one year of work experience under the supervision of a registered landscape architect, one can apply to write the written oral examinations required for registration. Upon successful completion of these exams, an individual is registered with the Society and assumes the professional designation of Landscape Architect.

The University of British Columbia offers a master's degree in landscape architecture through the Faculty of Agricultural Sciences. Admission is based on academic standing, commitment to the discipline and creativity, as demonstrated by a portfolio of work. The program emphasizes landscape design in urban and regional contexts and in terms of natural resources.

Skills required by landscape architects are similar to those required by architects. They need to be creative and imaginative, be able to visualize space relationships in three dimensions, have a concern for detail and accuracy and be organized and self-motivated. They must be able to work well with others and have good communication skills. They should be comfortable working with computers, be able to handle pressure of deadlines, be able to accept criticism and have problem-solving abilities. Some knowledge of business and marketing is necessary for those who are self-employed.

Urban and *land use planners* require at least a bachelor's degree in a relevant discipline, such as urban and regional planning or architecture. A degree in geography may be sufficient in some cases. They are usually members of the Canadian Institute of Planners. A minimum of two years of acceptable work is required in order to obtain a membership.

Simon Fraser University (SFU) offers a one-year certificate and a two-year post-baccalaureate diploma in urban studies. Study for both is interdisciplinary, including the faculties of geography, political science, sociology and anthropology. The certificate is available to undergraduates who wish to have a concentration in this area, and the diploma is available to those who have a bachelor's degree and wish to expand their knowledge.

The University of British Columbia (UBC) offers urban land economics as an optional study area within a bachelor's degree in commerce. A master's degree and a doctoral degree in community and regional planning are also available at UBC. Areas of concentration for the graduate degrees include community development planning, regional and natural resources planning and international development planning. Successful applicants to these programs must have a bachelor's degree, with high standing in a social science or natural science field, with preference given to those with degrees in commerce, architecture, engineering, agriculture and forestry. For information on obtaining bachelor's degrees in these fields refer to the other profiles as appropriate.

UBC also offers a two-year, part-time certificate program in site planning, which focuses on the residential environment. Applicants to this program may have a bachelor's degree or a two-year certificate in a related discipline, membership in a related professional association, or completion of secondary school with evidence of substantial relevant experience. A correspondence diploma program in urban land economics is also available through UBC's Faculty of Commerce.

A bachelor's degree in geography is available from SFU, UBC, UVic and the University of Northern British Columbia. Master's degrees in geography can be completed at UNBC, UVic and UBC, and the latter two universities also offer doctoral degrees in this field. Okanagan University College, the University College of the Cariboo and the University College of the Fraser Valley offer bachelor's degrees in geography. Associate degrees in geography are offered by Kwantlen University College and Langara College.

People in urban and land use planning need to be creative and imaginative, be able to visualize space relationships in three dimensions, have a concern for detail and accuracy and be organized and self-motivated. They must be able to work well with others, and they require good communication skills. They should be comfortable working with computers and have problem-solving abilities. Many successful people in this field have an interest in mathematics, physics, history, art and environmental factors.

Land surveyors require a bachelor's degree in a relevant discipline, such as surveying engineering, survey science or geomantics, followed by a period of training as an articled pupil. An alternate route is to complete a diploma in a relevant field, then complete the Western Canadian Board of Examiners Certificate of Completion of Academic Requirements for Land Surveyors program, and then commence the articling period. This training is followed by a mandatory examination administered by the Corporation of Land Surveyors of the Province of B.C. For some surveying positions a master's degree may be required.

The British Columbia Institute of Technology offers a two-year diploma in surveying and mapping.

People in this field need to be able to visualize space relationships in three dimensions, have a concern for detail and accuracy and be organized and self-motivated. They must be able to work well with others, and they require good communication skills. They should have problem-solving abilities. Work outdoors may be necessary, especially for land surveyors, and requires comfort working in varying weather conditions in sometimes rugged terrain. As well, since survey parties work in close personal contact for lengthy periods of time, an even temperament and an ability to cooperate with others is also needed. Research abilities, needed to uncover historical evidence, are valuable, and computer skills are generally needed. An understanding of the Global Positioning System is useful, as is knowledge of land law as it applies in Canada and elsewhere.

Working Conditions

Workers in this occupational group perform many of their duties in offices, but some (land surveyors in particular, but also architects and landscape architects) spend much of their time outdoors, weather permitting. Fieldwork involves examining site features so that workers can develop or adjust plans either for land use development (planners), buildings or landscaping (architects and landscape architects), or surveys (land surveyors).

Although their usual work schedules call for a standard 35 to 40 hours per week, workers in this group may have to attend evening or weekend meetings or public hearings. Those working in the private sector should be prepared to work outside of conventional office hours more frequently.

Architects and *landscape architects* must often deal with long working hours, demanding clients and some delays in obtaining approval for their projects. *Planners* in government can expect some opposition from interest groups, while those in the private sector may encounter delays during the development application process. *Land surveyors* must be prepared for some work in inclement weather, difficult geographic terrain and, in more remote areas, dealing with dangerous wildlife. All workers in this group have to be ready for heavy workloads and the pressures of tight deadlines.

In 1995 the average annual earnings for all workers in this occupational group were $42,900, with the 62% who worked full time for the whole year receiving an average of $52,700. The respective all-occupation averages were $27,900 and $39,400. Average annual earnings were higher for planners, at $51,200 ($57,500 for those working full time, full year) and lower for landscape architects, at $37,600 ($46,000 for those working full time, full year).

This is a medium-sized occupational group, with architects accounting for 47% of the workers, planners accounting for 25%, land surveyors accounting for 23% and landscape architects accounting for 5%. The number of employed workers decreased from 4,520 in 1990 to 3,950 in 1998. The decrease mainly affected the number of workers employed as architects. A shift toward smaller-scale construction projects, such as home renovation, has prompted some workers to start their own firms. This trend is reflected in the high rate of self-employment for architects (54%) and landscape architects (44%). By comparison, only 15% of planners and 19% of land surveyors are self-employed. (The all-occupation average is 15%.)

Only 10% of the entire group works part time, reflecting the intensive nature of this line of work. As with most professional occupations, unemployment is lower than the average for all occupations. Full-time, part-year work for this occupational group (28%) is about the same as the all-occupation average, except for land surveyors, at 39%. In this case, their work schedules are greatly influenced by the seasons.

The largest employers of workers in this group are professional business services (66%), such as architectural firms. Other industries include local and other government (17%) and construction (7%). As is often the case with an occupation focused on professional business services, there is a higher concentration of workers located in the Lower Mainland (67%) than for the workforce as a whole. The distribution of the balance of workers in this occupational group is 17% on Vancouver Island, 11% in the Okanagan/Kootenay region and 5% in Northern B.C.

This occupation is dominated by men. Only 17% of the workers in this group are women. The amount of education and experience needed to become established in this occupational group is reflected in the low proportion of workers in the 15 to 24 age group (1%). Those workers aged 35 to 54 represent 60% of this group, compared to 49% for the workforce as a whole. The average age of the entire group is 43, more than five years older than the all-occupation average for the province.

Employment Prospects

This is a medium-sized occupational group, made up of about 3,950 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment in this group to grow at an annual rate of 1.8%, about as fast as the average for all occupations. According to this projection, 1,690 positions will become available from 1998 to 2008. Most of these openings (54%) are projected to come from the need to replace workers who retire and the remainder from growth in the number of new positions.

Architects make up the largest occupation in this group. Employment in this occupation is projected to grow about as fast as the all-occupation average. This projection amounts to 760 openings, including new jobs and jobs to replace those who retire. Employment of *urban* and *land use planners* is projected to grow faster than the all-occupation average and faster than any other occupation in this group. A total of 450 openings are projected to become available for these professionals. Employment of *professional land surveyors* is projected to grow about as fast as the average rate for all occupations, amounting to 390 openings over the projection period. Employment of *landscape architects* is projected to grow faster than the all-occupation average. However, because this is a very small occupation, only 80 openings are projected to become available for landscape architects.

Nearly all architects and many landscape architects in B.C. work in the professional business services industry, which includes engineering as well as architectural firms. Much of the available work depends on the construction industry, which can be subject to business and housing cycles as well as seasonal fluctuations. Employment growth for architects is driven by growth in the number of houses and other buildings and by growth in the business services industry. The occupations of architect and landscape architect are vulnerable to economic conditions. In addition, not all construction requires architects, so marketing of services is important to encourage the inclusion of architectural services in construction design.

A growing trend toward home renovation means there may be increasing work opportunities in smaller companies, where architects and landscape architects may need to be more involved in the marketing and other business aspects of the industry. In these positions, they will need to use strong interpersonal and communication skills to attract a client base and deal directly with clients.

Most urban and land use planners are employed by the local/municipal or provincial government. Government funding restraints may cause the actual employment growth rate of this occupation to fall below the COPS forecasted rate.

Employment of *land surveyors* is projected to grow about as fast as the all-occupation average. However, increases in productivity due to more efficient surveying techniques have slowed the employment growth of relatively low-skilled surveyors. Employment growth is considerably higher for relatively high-skilled surveying specialists who conduct surveying for streets, commercial developments, housing developments and recreational facilities. This is particularly true for those who are also skilled in mapping and computer programming and have a strong understanding of survey land law.

Opportunities for *surveyors* will be greater in the private sector (with increasing self-employment) while openings in the financially-strapped government sector will be limited. Employment also depends on the construction industry. This industry peaks during the mild-weather months, so employment for surveyors may decrease during the winter, although there is still office work to be completed when there is no fieldwork to be conducted.

Advances in technology are having a considerable impact on employment and skill requirements in all occupations in this group. The role of computerized design and engineering systems in architecture has rapidly increased in the last decade. Similarly, urban planners and land surveyors are using computerized mapping and information systems, such as geographic information systems (GIS) and the Global Positioning System (GPS), more than ever before. Architects, urban planners and land surveyors who are competent in using these and other new technologies will have an advantage over others in competing for employment opportunities.

Additional Information

Canadian Architectural Certification Board
http://www3.sympatico.ca/cacb/index.html

Royal Architectural Institute of Canada http://www.raic.org

Architectural Institute of B.C. http://www.aibc.bc.ca

B.C. Society of Landscape Architects http://www.bcsla.org

Canadian Institute of Planners http://www.cip-icu.ca

Western Canadian Board of Examiners for Land Surveyors http://www.ensu ucalgary.ca/wcbe/index.htm

Corporation of Land Surveyors of the Province of B.C. http://www.bclandsurveyors.bc.ca

Related Occupations

architects (2151):

- architecture and science managers (in 01/09 middle and other management)
- naval architects (in 214 other engineers)
- structural engineers (in 213 civil, mechanical, electrical and chemical engineers)

landscape architects (2152):

- landscape and horticulture technicians and specialists (2225)
- landscape architecture managers (in 01/09 middle and other management)
- landscape design contractors (in 825 contractors, operators and supervisors in agric/hort/aqua)

urban and land use planners (2153):

- managers in land use planning (in 01/09 middle and other management)

land surveyors (2154):

- civil engineers (in 213 civil, mechanical, electrical and chemical engineers)
- civil engineering technologists and technicians (in 223 technical occupations in civil, mechanical and industrial engineering)
- survey technologists and technicians (in 225 technical occupations in architecture, drafting, surveying and mapping)
- hydrographic surveyors (in 211 physical science professionals)

> ***People in this field need to be able to visualize space relationships in three dimensions, have a concern for detail and accuracy and be organized and self-motivated. They must be able to work well with others, and they require good communication skills. They should have problem-solving abilities.***

Mathematicians, Statisticians and Actuaries

NOC 2161

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	350	540	690

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
150	90	240

Annual Growth 1998-2008 2.5%

Main Industries of Employment

Other Business Services	37%
Education	11%
Professional Business Services	8%

Employment by Region

Lower Mainland	75%
Vancouver Island	20%
Northern B.C.	0%
Okanagan/Kootenay	6%

Self-employment 10%

Nature of the Work

Mathematicians and *statisticians* research mathematical or statistical theories, and they develop and apply mathematical or statistical techniques for solving problems in such fields as science, engineering, business and social science. *Actuaries* apply mathematical and statistical methods to calculate premium and benefit payments for insurance and annuity purposes. *Mathematicians, statisticians* and *actuaries* are employed by universities, government, bank and trust companies, insurance companies, pension benefit consulting firms or science and engineering consulting firms. Increasingly, mathematicians are also working for computer software companies.

Main Duties

Mathematicians conduct research to extend mathematical knowledge in traditional areas of mathematics, such as algebra, geometry, probability and logic. Further, they apply mathematical techniques to the solution of problems in scientific fields, such as physical science, engineering, computer science or other fields, such as operations research, business or management.

Statisticians conduct research into the mathematical basis of the science of statistics, develop statistical methodology and advise on the practical application of statistical methodology. They also apply statistical theory and methods to provide information in scientific and other fields, such as biological and agricultural science, business and economics, physical sciences and engineering and the social sciences.

Actuaries apply mathematics, probability, statistics and risk theory to calculate future risks associated with insurance, annuity and pension programs. They also use these techniques to provide legal evidence on the value of future earnings.

Example Titles

- mathematician
- statistician
- actuary
- demographer
- statistical analyst
- biostatistician
- insurance actuary

Education and Training

Mathematicians and *statisticians* generally require at least a master's degree. *Actuaries* usually require a university undergraduate degree or college diploma in mathematics, statistics or operations research to successfully complete professional examinations, and they must have three years of related work experience in order to receive necessary accreditation with the Canadian Institute of Actuaries.

Several university colleges in B.C. offer courses in these fields for as much as two years of credit when transferring into a university degree program. As well, some offer bachelor's degrees in partnership or association with a larger university. However, in the latter case, students may be required to complete some of the degree as a visiting student at the university, and not all of these degree programs are suitable for those who wish to pursue graduate work.

Camosun College offers an associate degree in math and statistics. Okanagan University College, the University College of the Cariboo, the University College of the Fraser Valley and the University of Northern British Columbia offer bachelor's degrees in mathematics. The University of British Columbia, the University of Victoria and Simon Fraser University (SFU) offer bachelor's, master's and doctoral degrees in mathematics and in statistics. SFU offers a certificate in actuarial mathematics, which prepares students for most of the accreditation exams.

Working Conditions

Mathematicians work mostly in an office environment with structured work schedules, although deadlines, special requests for information or analysis, and travel to attend seminars or conferences are sometimes part of the job and may require overtime hours. Their work is highly intellectual and can cover many different specialties. Mathematicians are employed by smaller companies in the consulting field (for example, computer applications), by larger banks and insurance corporations as researchers, and in education as teachers. They may work alone, with other mathematicians, or as part of a varied team that may include engineers, computer scientists, physicists, and technicians. Those in the mathematics faculty in post secondary institutions may have more flexible work schedules and divide their time among teaching, research, and administrative responsibilities.

Statisticians usually work a regular 40-hour week, although they may be required to travel in order to supervise or set up a survey, or to obtain statistical data. The kind of work can vary as some statisticians perform repetitive tasks, while others conduct a variety of tasks (for example, in designing experiments).

Actuaries have comfortable working conditions in offices and generally work regular hours, although some actuaries, particularly consulting actuaries, must often travel to meet with clients and should expect to work more than 40 hours per week.

The estimated average earnings for all workers in this occupational group were $46,300 in 1995. About 57% of the workers are employed full time, full year, and their annual earnings averaged $59,100. The respective all-occupation average earnings in the province in 1995 were $27,900 and $39,400.

There were 350 mathematicians, statisticians and actuaries employed in B.C. in 1990. By 1998 that number had risen to 540 people. Self-employment for the profession in B.C. is at 10%, which is below the 15% provincial average for all occupations. Part-time employment is at 11%, and this is well below the all-occupation average for B.C. (26%). The unemployment rate is also lower than the average for all occupations.

About 44% of the people in these occupations are employed in professional and other business services. The education field accounts for 11% of the workers, 9% work for the federal or provincial administration, and 5% are employed in the finance, insurance and real estate industry. This group is associated with large businesses and government, so it is not surprising that the majority of workers are located in the Lower Mainland (75%) and in Victoria (13%).

Close to half (46%) of employed mathematicians, statisticians and actuaries in B.C. are women, the same as the provincial average for all occupations. There are slightly more workers in the 45 to 54 age range (30%) than the all-occupation average (21%), but overall the age distribution does not vary much from that for the workforce as a whole. The average age for workers in this occupation is 39.

Employment Prospects

This is a very small occupational group, made up of only about 540 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment in this group to grow at an annual rate of 2.5%, much faster than the average for all occupations. However, as it is such a small group, only 240 positions are projected to become available from 1998 to 2008. Almost two-thirds of these openings will result from growth in the number of new positions, and the remainder will come from the need to replace workers who retire.

One of the driving forces behind this forecast of employment growth for *mathematicians* is the continuing computerization of our working world. The demand for mathematicians is directly related to advances in computer applications. Most computer, science and engineering professions require extensive mathematical training, which boosts the demand for mathematicians by opening up opportunities for teaching at all levels. Mathematicians are also taking on a prominent role in electronic information technologies. For example, encryption codes designed to ensure that only intended viewers can view transmissions on the Internet are based on new mathematical algorithms.

Teaching and research opportunities in the private sector are expected to increase significantly, and academic mathematicians are also likely to become more involved in part-time consulting work dealing with computer sciences and software. The growth of insurance, real estate and more complex financial businesses will also increase the demand for mathematicians who specialize in actuarial or financial and business work. In the future it is probable that this field will provide more application-driven job opportunities (for example, financial software development) than is currently the case.

Additional Information

Canadian Institute of Actuaries
http://www.actuaries.ca/information/infoe.htm

Related Occupations

- computer systems analysts (2162)
- computer programmers (2163)
- financial and investment analysts (1112)
- financial auditors and accountants (1111)
- other financial officers (1114)

Computer Systems Analysts

NOC 2162

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	4,810	10,930	16,960

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
6,030	2,050	8,080

Annual Growth 1998-2008	4.5%

Main Industries of Employment

Other Business Services	47%
Finance, Insurance, and Real Estate	6%
Professional Business Services	5%

Employment by Region

Lower Mainland	74%
Vancouver Island	19%
Northern B.C.	2%
Okanagan/Kootenay	5%

Self-employment	14%

Nature of the Work

Computer systems analysts are an integral part of the rapidly growing computerization of the world economy, and the B.C. economy is no exception. As such, systems analysis belongs to the group “enabling technologies,” which are technologies that are not limited to one particular industry sector. Instead, computer based systems and applications drive part of the restructuring in a variety of sectors in the economy. As the move into an information society progresses further, the need for more and faster information flows is becoming crucial.

This need is increasingly served by computers and the communications networks that integrate them. The design and administration of such computer applications is handled in part by systems analysts. More and more computerized applications involve networks. Networks can either be locally based and internal to a specific user group (that is, local area networks or LANs), or they can be regional or national in nature (that is, wide area networks or WANs). With the rise of Internet-based communications and business systems, computer applications are now literally worldwide in scope.

On a daily basis, computer systems analysts analyse information processing or computation needs, design computer systems that provide solutions to these problems or perform the needed computations, analyse databases and supervise computer programmers. Computer systems analysts are employed in computer consulting firms, telecommunications firms, banks and computer systems units throughout the private and public sectors.

Main Duties

Computer systems analysts confer with clients regarding the nature of the information processing or computation needs that a computer program is to address. They analyse these needs into related components that can be solved through the application of computer technology, and they write requirement specifications for computer programs, identifying the steps in the program and the algorithms to be employed. They communicate program specifications to computer programmers. They test and implement computer programs and provide user training, and they plan and implement computer security systems for database access control. They also analyse and develop database directories, generate and maintain databases and analyse databases and their required software solutions. They may supervise computer programmers or other systems analysts or serve as project leaders for particular systems projects.

While there are many different functions and niches in the field of systems analysis, the main duty of a systems analyst is to design and apply computer system setups for a variety of business and research applications.

Systems analysts help to define a particular business and/or research task for small and big business and design appropriate computer based solutions for the business task at hand. For example, a clothing company with many different outlets in B.C. may need fast information on which particular style of jacket sells in various locations and what the inventory levels are for the jackets. A network computerized sales and inventory tracking system might be the solution proposed by a systems analyst working for the company. The systems analyst would design this application and also be involved in the implementation and administration of the company-wide system.

Later, the systems analyst might be involved in upgrading the company computer system with new software that would allow someone to track wages paid by the company for its employees. Systems analysts get involved in the blueprinting for a complete new system purchase or the design of how to tie existing computers (sometimes those with different sizes and capabilities) together into a coherent unit.

Example Titles

- applications analyst - computer systems
- computer analyst
- computer consultant
- project manager - computer systems
- user support analyst - computer systems
- computer graphics specialist
- business systems specialist
- consultant, management information systems (mis)
- electronic data processing (EDP) analyst
- management information systems (mis) analyst
- systems analyst
- systems operations specialist

©Stone/Vancouver

Education and Training

Computer systems analysts usually complete a college program or undergraduate degree in an area such as computer science, commerce, business administration or mathematics. They require some experience in computer programming, and those who wish to specialize in commercial, engineering or scientific applications must undertake specific appropriate programs of post secondary study or experience.

Courses related to this field are available at most B.C. post secondary institutions. These courses vary in length and range from introductory level to courses for professionals who wish to upgrade existing skills. Similarly, most colleges, institutes, university colleges and universities in the province offer degree, diploma or certificate programs in this area. North Island College, Douglas College, College of New Caledonia and Kwantlen University College have certificate programs in computer information systems. Diploma programs in computer information systems are available at Kwantlen University College, University College of the Fraser Valley (UCFV), Douglas College, Langara College, Okanagan University College (OUC), Selkirk College and the College of New Caledonia (CNC). University College of the Cariboo (UCC) and Kwantlen University College offer computer technician programs. Camosun College, Northwest Community College, Malaspina College and the British Columbia Institute of Technology (BCIT) offer programs in computer technology. UCC also offers a computer systems operations and management diploma. Capilano College offers a Computing Science Diploma program and a network specialist certificate.

The University of Northern British Columbia (UNBC) offers a bachelor's degree in computing science, as do Simon Fraser University (SFU) , UCC, UCFV and the Technical University of British Columbia. The University of British Columbia (UBC) and the University of Victoria (UVic) offer bachelor's, master's and doctoral degrees in computing science. SFU has available a post-baccalaureate diploma for those who have a bachelor's degree and wish to upgrade. Bachelor of technology degrees in computing and computer systems are available from the Open Learning Agency (OLA), UCC, BCIT and Kwantlen University College.

Nearly all post secondary institutions offer courses or programs in business. Most diploma programs in business can be used to transfer into the third year of a university bachelor's degree program.

Undergraduate programs in business administration are available at many post secondary institutions in the province. Most universities offer master's programs in business administration. Royal Roads University offers a master's of business administration in digital technologies management.

For educational programs in mathematics, see the profile Mathematicians, Statisticians and Actuaries (2161).

Computer systems analysts must enjoy precise, detailed work. An ability to organize and work methodically is important. Analytical and problem-solving abilities are needed, as well as creativity. Good oral and written communication skills are required. Continual upgrading is needed in order to remain competitive.

Working Conditions

Systems analysts are generally in high demand. Their working conditions can be interesting but challenging. They work in offices or laboratories in comfortable surroundings.

Although they often work a regular 40 hour week, both the implementation of a new computer system (or software) and "trouble shooting" in mission-critical applications can translate into very long hours during times of crisis. Further, some computer/network maintenance or upgrade work can only be performed after hours or on weekends, during off-peak hours. The working environment can require a systems analyst to be both patient and flexible. In addition, because their work requires them to sit for long hours at a keyboard, computer systems analysts can be at risk of developing eye strain and backaches as well as hand and wrist problems.

The annual average earnings for all systems analysts in B.C. were $43,500 in 1995. Full-time, full-year employees earned an average of $49,900. The respective all-occupation averages in the province were $27,900 and $39,400. Junior positions start at approximately $24,000, while senior systems analysts can expect to earn as much as $65,000 per year. According to a survey of recent college graduates, the average salary for new entrants to this occupation was $2,950 per month ($35,400 per year).

There were about 4,810 systems analysts employed in 1990. This occupation has experienced substantial growth. The number of workers more than doubled, reaching 10,930 people employed in 1998. The proportion of self-employed workers in this group actually declined from 17% to 14% between 1990 and 1995.

This is primarily a full-time occupation. Over 90% of the workers are employed full time, 71% work full time for the whole year, and only 8% work on a part-time basis. The unemployment rate is lower than the average for all occupations. Much of the unemployment usually is temporary in nature, when people are "between projects." There is little seasonal variation in the employment patterns of systems analysts.

More than half (52%) of systems analysts are employed in professional and other business services. The balance of workers are spread across a variety of industries with the federal and provincial governments accounting for 6% and telecommunication carriers and education accounting for 4% each.

This is an occupation that tends to address the needs of medium and large companies and public organizations. It is not surprising that about 74% of the workers live in the Lower Mainland and another 16% live in Victoria. In contrast, only 5% of the workers live in the Okanagan/Kootenay region, and 2% live in Northern B.C. (The respective all-occupation worker distribution is 57% in the Lower Mainland, 9% in Victoria, 15% in the Okanagan/Kootenay region and 10% in Northern B.C.)

The majority of systems analysts are men (72%), and their average earnings for full-time, full-year work at $51,500 is about 11% higher than their colleagues who are women. This a relatively young profession. Workers aged 25 to 44 represent 76% of the systems analysts, compared to only 53% of the workforce as a whole. The average age of the workers is 37.

Employment Prospects

This is a very large occupational group, made up of about 10,930 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment in this group to grow at an annual rate of 4.5%, much faster than the average for all occupations. In fact, this occupation (and related ones such as computer programming) is projected to be among the fastest growing professional occupations in the B.C. economy. According to this projection, a total of 8,080 positions will become available from 1998 to 2008. Three-quarters of these openings are projected to result from growth in the number of new positions and the remainder will come from the need to replace workers who retire.

Increasing global competition and the continued trend towards computerization are interacting in a way that is causing rapid employment growth for *computer systems analysts*. Organizations are striving toward maximizing the efficiency of their computer systems in order to remain competitive in the global economy. This has led to the further proliferation of communications and computer networks, including the Internet and new "cable" technologies. With each new generation of computer technology and operating system, existing business applications have to be made to work, or upgraded altogether. Furthermore, the increase in the networking of computers will tie more and sometimes different platforms together. That, in turn, will make specialized systems analysts indispensable. Finally, many of these professionals move into management positions as companies integrate technical developments into their operations. This will create additional openings for computer systems analysts.

Industry sources agree that there will be significant employment growth for computer systems analysts. They support this by pointing to the rapid growth in the computer services sector and the growing utilization of information technology throughout the whole B.C. economy. Other factors include growth in the use of local and wide area computer networks (LANS and WANS), increased usage of the Internet for commerce and business functions, and the growing utility of data base systems to enable more informed decision making by businesses.

The computer services field is also evolving, and new related occupations are emerging. For example, the occupation of *data base administrator* (DBA) has recently emerged. The National Occupational Classification System (NOCS) has not been adjusted to account for this occupation because it is so new and encompasses aspects of other occupations. It requires strong statistical skills and encompasses aspects of occupations in the field of data base architecture but is primarily a highly skilled computer-related occupation. For this reason, persons in this and other similar occupations are presently accounted for under the NOC occupational titles of *computer systems analysts* and *computer programmers*.

Self-employment, contract and consulting work are important for this occupation. As developments continue to provide seamless contact worldwide through the Internet, there will be greater international competition for contracts and consulting work. This could mean more opportunities for workers located in B.C., but they will have to be able to market their service effectively, both locally and internationally.

Employment of computer systems analysts is less sensitive to general economic conditions than most other occupations. This is because the services that these professionals provide contribute to efficiency and cost reductions of many organizations regardless of economic conditions. However, opportunities in this field are greatly affected by the adoption of new computer technologies throughout the economy. Generally, new computer technologies need to be integrated into existing systems and this will increase the employment demand for computer systems analysts.

It is even more important now than ever before for computer systems analysts to keep abreast of advancements in computer technology. Those who constantly upgrade their skills and keep current with changing information technology trends will have an advantage over others in competing for work opportunities.

Additional Information

For more information on computer-related occupations, see the *Information Technology Occupations* section in the *Introduction to Work Futures*.

Software Human Resource Council http://www.shrc.ca/

Related Occupations

- computer engineers (in 214 other engineers)
- information systems and data processing managers (in 01/09 middle and other management)
- computer service technicians (in 2242 electronic service technicians)
- computer training representatives (in 4131 college and other vocational instructors)
- programmer analysts (in 2163 computer programmers)

It is even more important now than ever before for computer systems analysts to keep abreast of advancements in computer technology. Those who constantly upgrade their skills and keep current with changing information technology trends will have an advantage over others in competing for work opportunities.

Computer Programmers

NOC 2163

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	3,490	8,460	13,130

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
4,670	1,590	6,260

Annual Growth 1998-2008	4.5%
Main Industries of Employment	
Other Business Services	51%
Finance, Insurance, and Real Estate	7%
Professional Business Services	4%
Employment by Region	
Lower Mainland	75%
Vancouver Island	17%
Northern B.C.	2%
Okanagan/Kootenay	6%
Self-employment	18%

Nature of the Work

Computer programmers write computer programs by coding sets of instructions into machine-readable form. They are employed in computer software and consulting firms and in programming units throughout the private and public sectors. Since the computer services industry is one of the fastest-growing sectors in B.C.'s economy, demand for computer programmers is expected to be very strong over the next decade. However, the demand to upgrade the programmers' skill sets continually is expected to be equally strong. The industry is viewed as an enabling industry, which means that advances in computer programming filter through to other industrial sectors. Computer programmers in B.C. are also in short supply because some qualified B.C. programmers are moving to the U.S., where their career opportunities are greater and the dominant reputation of U.S. companies looks very attractive.

Main Duties

Computer programmers write computer programs or software packages by coding instructions and algorithms into computer-readable form. They test, debug, document and implement computer programs or software packages, as well as maintain existing computer programs by making modifications as required. Computer programmers may act as a resource aide, solving computer problems for users along with helping to develop and customize company software applications.

Example Titles

- programmer analyst
- scientific programmer
- programmer - computer systems
- application programmer

- software programmer
- operating systems programmer
- software development programmer
- systems programmer
- business programmer
- interactive media developer
- software architect
- web programmer
- web technician
- software engineer

Education and Training

Computer programmers usually complete a college program or bachelor's degree in computer science, or an undergraduate degree in another discipline with a significant programming component, such as commerce, business administration or mathematics. Programmers who wish to specialize in commercial, engineering or scientific applications must undertake specific appropriate programs of post secondary study or experience.

Most universities offer bachelor's, master's and doctorate programs in computer programming. Most university colleges offers bachelor's degrees in this field of study. Most colleges and university colleges offer various courses in computer programming, with most offering diploma program options.

The University of Northern British Columbia (UNBC) offers a bachelor's degree in computing science, as do Simon Fraser University (SFU) , University College of the Cariboo (UCC), University College of the Fraser Valley (UCFV) and the Technical University of British Columbia. The University of British Columbia (UBC) and the University of Victoria (UVic) offer bachelor's, master's and doctoral degrees in computing science. SFU offers a post-baccalaureate diploma for those who have a bachelor's degree and wish to upgrade their information technology skills. Bachelor of technology degrees in computing and computer systems are available from the Open Learning Agency, UCC, BCIT and Kwantlen University College. Royal Roads University offers a master's of business administration in digital technologies management.

Camosun College offers an associate degree in computer science. Kwantlen University College offers a diploma in computer science. North Island College offers a diploma in computer science and technology. These programs all take two years to complete. Langara College has a certificate program in computer science and technology, designed for those with work experience who wish to upgrade.

Computer programmers should enjoy mathematics, as well as detailed and precise work. They should be organized, methodical and analytical, with good communication skills. Creativity and problem-solving abilities are important. Programmers should be able to work independently and as part of a team. A willingness to upgrade continually is necessary.

Working Conditions

Working conditions in computer programming can vary between firms. However, the industry is known to require long hours during certain phases of programming, with intense workloads bumping against tight deadlines. The "de-bugging" phase of computer programming in particular is very stressful, and the industry is known to have a high rate of "burn-out." On the other hand, computer programming can be very rewarding for those who are involved in meeting the demands of a new trend. As computer programmers spend long periods sitting at a computer and typing, workers in these occupations may be at risk of eye strain and backaches as well as hand and wrist problems.

Overall earnings for *computer programmers* in 1995 averaged $35,100, while full-time, full-year earnings averaged $45,500. The respective all-occupation annual average earnings in the province were $27,900 and $39,400. Women in full-time, full-year positions averaged 6% less than men. According to a survey of recent college graduates, the average salary for new entrants to the occupation of computer programmer was $2,790 per month ($33,400 per year).

This is a large occupational group. The number of workers has more than doubled from 3,490 in 1990 to 8,460 in 1998. In fact, even these figures may tend to be low, because many programmers start professional programming on their own time while still employed in other occupations or companies. Therefore, such part-time programmers may not be included in the employment estimates. This situation also affects self-employment and part-time employment numbers. Self-employed computer programmers account for approximately 18% of the workers, which is higher than the all-occupation average in B.C. (15%). Part-time workers represent only 10% of the total employment in computer programming. The all-occupation rate for part-time employment in B.C. is 26%.

The unemployment rate in computer programming is lower than the average for all occupations. Unless a programmer has not kept up with new skills, unemployment is likely to be limited to frictional unemployment, which refers to people who are not currently employed but only because they are between definite jobs. As is the case with many other computer-related occupations, there is relatively little seasonality in programming work. More than half of computer programmers in B.C. (56%) work for software and other companies as part of the professional and other business services sector. Software companies also contract with corporations in other areas (such as government or banking) for programming development. Another 7% of computer programmers are employed directly in the finance, insurance and real estate sector, 4% work for telecommunication carriers, and 3% work in education.

In terms of geographical distribution, 75% of computer programmers work in the Lower Mainland, and a further 14% work in Victoria. By comparison, 57% of the entire workforce are located in the Lower Mainland, and 9% are located in Victoria. The concentration of programmers in these two communities is a reflection of the occupation's focus on serving the computing needs of medium and large companies and public organizations. The balance of programming employment tends to follow the general distribution of the workforce, with 6% located in the Okanagan/Kootenay region, 2% in Northern B.C. and 3% on the rest of Vancouver Island. While growth in computer programming employment is expected to occur in all regions of B.C., the Lower Mainland will probably remain the most dominant region in terms of its share of employment.

Women make up only 22% of B.C.'s computer programmers. This is expected to change as educational institutions are actively recruiting more women students to enter studies for this well-paid, high-growth profession. Workers in this profession tend to be young. Those in the 25 to 34 age range represent 43% of all computer programmers, compared to just 25% of the workforce as a whole. In addition, another 31% of the workers are in the 35 to 44 age range (which is about the same as for all occupations). Overall, 86% of programmers are under 45, compared to just 68% for all occupations. The average age for computer programmers is 34.

Employment Prospects

This is a large occupational group, made up of about 8,460 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment in this occupation to grow at an annual rate of 4.5%, much faster than the average for all occupations. In fact, this occupation (and related ones, such as computer systems analysts) is projected to be among the fastest growing professional occupation in the B.C. economy. According to this projection, a total of 6,260 positions will become available from 1998 to 2008. Three-quarters of these openings are projected to result from growth in the number of new positions, and the remainder will come from the need to replace workers who retire.

Increasing global competition and the continued trend toward computerization are interacting in a way that is causing rapid employment growth for *computer programmers*. Organizations are striving toward maximizing the efficiency of their information, financial and other computer systems in order to remain competitive in the global economy. A growing number of new ways that computers can help to make organizations more efficient are being discovered. Often these discoveries entail hiring a computer programmer(s) to write the appropriate program(s). As well, with each new generation of computer technology and operating systems, computer programmers are often called upon to make existing business applications compatible, or upgrade them altogether.

Industry sources agree that there will be significant employment growth for computer programmers. They support this by pointing to the rapid growth in the computer services sector and the growing utilization of information technology throughout the whole B.C. economy. Other factors include growth in the use of local and wide area computer networks (LANS and WANS), increased use of the Internet for commerce and business functions and the growing utility of data base systems to enable more informed decision making by businesses.

The computer services field is also evolving, and new related occupations are emerging. For example, the occupation of *data base administrator* (DBA) has recently emerged. The National Occupational Classification System (NOCS) has not been adjusted to account for this occupation because it is so new and encompasses aspects of other occupations. It requires strong statistical skills and encompasses aspects of occupations in the field of data base architecture but is primarily a high-skilled computer-related occupation. For this reason, persons in this and other similar occupations are presently accounted for under the NOC occupational titles of *computer systems analysts* and *computer programmers*.

While some *applications programmers* do work for companies and industries to tailor computers and software to their specific needs, many work on more generic software for business, industrial and personal computer use.

Self-employment, contract and consulting work is important for this occupation. Entrepreneurial programmers can be successful starting their own software companies that specialize in a particular niche of programming, such as games or business accounting software.

Programming work is already global in scope. As developments continue to provide seamless communications and applications worldwide through the Internet, there will be greater international competition for contracts. This could mean more opportunities for workers located in B.C., but it will also mean that those interested in this field will have to be able to market their services both locally and internationally.

Employment of computer programmers is less sensitive to general economic conditions than most other occupations. This is because the services that these professionals provide contribute to efficiency and cost reductions of many organizations regardless of economic conditions. However, opportunities in this field are greatly affected by the adoption of new computer technologies throughout the economy. Generally, new computer technologies need to be integrated into existing systems, and this will increase the employment demand for computer programmers.

It is more important today than ever before for computer programmers to keep abreast of advancements in computer technology. Those who constantly upgrade their skills and keep current with changing information technology trends will have an advantage over others in competing for work opportunities.

Additional Information

Software Human Resource Council http://www.shrc.ca/

For *software engineers*, the Canadian Council of Professional Engineers http://www.ccpe.ca/

For more information on computer-related occupations, see the *Information Technology Occupations* section in the *Introduction to Work Futures*.

Related Occupations

- computer operators (in 142 office equipment operators)
- computer systems analysts (2162)
- computer service technicians (in 2242 electronic service technicians)
- computer training representatives (in 4131 college and other vocational instructors)
- computer engineer (in 214 other engineers)

Skill Level B - Technical, Paraprofessional and Skilled Occupations

Technical Occupations in Physical Sciences

NOC 221

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	2,490	2,920	3,540

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
620	930	1,550

Annual Growth 1998-2008	1.9%
Main Industries of Employment	
Professional Business Services	31%
Services Incidental to Mining	7%
Public Transit and Other Transportation	6%
Employment by Region	
Lower Mainland	59%
Vancouver Island	14%
Northern B.C.	10%
Okanagan/Kootenay	16%
Self-employment	8%

Nature of the Work

Technical work in the physical sciences encompasses several different disciplines.

Applied chemical technologists and *technicians* may work independently or provide technical support in chemical engineering, chemical and biochemical research and analysis, industrial chemistry, chemical quality control and environmental monitoring. They are employed by research and development laboratories, by quality control laboratories, by consulting engineering companies, by chemical, petrochemical, pharmaceutical and a variety of other manufacturing and processing industries, and by utilities, health, education and government establishments.

Geological and *mineral technologists* and *technicians* may work independently or provide technical support and services in the fields of oil and gas exploration and production, geophysics, petroleum engineering, geology, mining and mining engineering, mineralogy, extractive and physical metallurgy, and metallurgical engineering. They are employed by petroleum and mining companies, by consulting geology and engineering firms, by governments and educational institutions, and by manufacturing, construction and utilities companies.

Meteorological technicians observe weather and atmospheric conditions, record and interpret meteorological data, transmit and report on recorded information, and provide meteorological information and advice to the general public, the transportation industry and the media. They are employed by the Atmospheric Environment Service of Environment Canada, the armed forces, private consulting companies, resource and utility companies, and provincial governments.

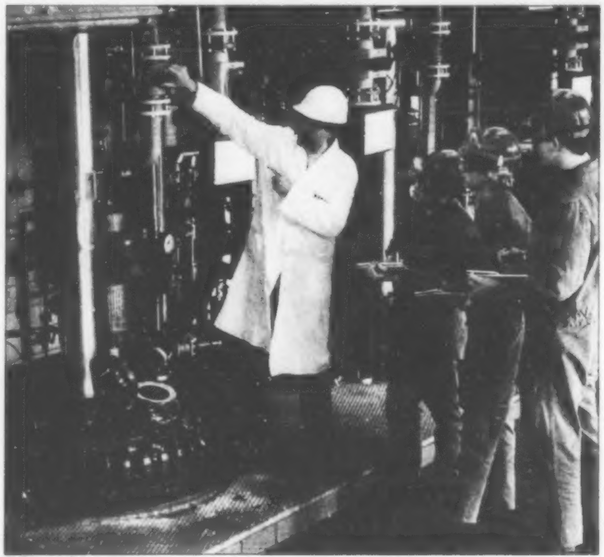
Main Duties

Applied chemical technologists set up and conduct chemical experiments, tests and analyses using techniques such as chromatography, spectroscopy, physical and chemical separation techniques, and microscopy. They also operate and maintain laboratory equipment and apparatus and prepare solutions, reagents and sample formulations. They compile records, interpret experimental or analytical results, and develop and conduct programs of sampling and analysis to maintain quality standards of raw materials, chemical intermediates and products.

They also assist in the development of chemical engineering processes, in studies of chemical engineering procurement, construction, inspection and maintenance, and in the development of standards, procedures and health and safety measures. Further, they operate experimental chemical or petrochemical pilot plants and assist in the design and fabrication of experimental apparatus.

Applied chemical technicians assist in setting up and conducting chemical experiments, tests and analyses. They operate and maintain laboratory equipment and apparatus, they prepare solutions, reagents and sample formulations, and they compile records for analytical studies. They also assist in developing and conducting programs of sampling and analysis to maintain quality standards. They carry out a limited range of other technical functions in support of chemical research, tests and analyses, and they assist in the design and fabrication of experimental apparatus.

Geological and *mineral technologists* conduct or direct geological, geophysical, geochemical, hydrographic or oceanographic surveys, prospecting field trips, exploratory drilling, well logging or underground mine survey programs. They operate and maintain geophysical survey and well logging instruments and equipment, and they prepare notes, sketches, geological maps and cross sections. They prepare, transcribe or analyse seismic, gravimetric, well log or other geophysical and survey data. They assist engineers and geologists in the evaluation and analysis of petroleum and mineral reservoirs. They prepare or supervise the preparation of rock, mineral or metal samples, and they perform physical and chemical laboratory tests.



©Stone/Vancouver

They may supervise oil and gas well drilling, well completions and work-overs, and they may conduct or supervise studies and programs related to mine development, mining methods, mine ventilation, lighting, drainage and ground control. They may also assist engineers and metallurgists in specifying material selection, metal treatments or corrosion protection systems, assist hydrogeologists in evaluating groundwater and well circulation and in report preparation.

Further, they may develop specifications for heat treatment of metals or for welding, design welding fixtures, troubleshoot welding processes or quality problems and supervise welding projects.

Geological and *mineral technicians* participate in geological, geophysical, geochemical, hydrographic or oceanographic surveys, prospecting field trips, exploratory drilling, well logging or underground mine survey programs. They operate and maintain geophysical survey and well logging instruments and equipment. They prepare notes, sketches, geological maps and cross sections, and they assist in preparing, transcribing or analysing seismic, gravimetric, well log, or other geophysical and survey data. They also assist in the preparation of rock, mineral or metal samples and in conducting physical and chemical laboratory tests. Further, they assist in hydrogeological field and laboratory studies and in preparation of reports, and they carry out a limited range of other technical functions in support of geology, geophysics and petroleum and mining engineering.

Meteorological technicians observe, record and transmit atmospheric and weather information, including air pressure, temperature, humidity, wind, precipitation, cloud and ultraviolet conditions. They observe, chart and report on ice conditions in navigable waters. They provide weather information to various users, such as pilots, farmers, shipping industries and news media, and they inspect and service various weather service installations and maintain equipment and instruments. They also analyse and interpret weather data, maintain climatological data bases, participate in the production of weather maps and charts, observe snow conditions and participate in programs to control avalanches in mountainous terrain.

Example Titles

applied chemical technologists and technicians (2211):

- chemical analyst
- food technologist
- analytical technician, chemical
- chemical laboratory analyst
- chemical research technician
- formulation technician
- industrial hygiene technologist
- laboratory technician, biochemistry
- mass spectrometer technician
- pilot plant technician
- laboratory technician, chemical
- laboratory technologist, chemical
- quality control technician, food processing
- chemical technologist
- chemical technician
- chemical engineering technologist
- chemical engineering technician
- quality control technician, chemical processing
- geochemical technician
- paint technician
- biochemistry technologist
- master dyer, textiles

geological and mineral technologists and technicians (2212):

- log technician
- marine geoscience technologist
- metallurgical technologist
- mineralogy technician
- mining technologist
- petroleum technician
- petroleum engineering technologist
- petrology technician
- reservoir engineering technician
- rock mechanics technician
- seismic technician
- welding technologist
- geological technician
- geophysical technologist

- assayer
- mining engineering technologist
- groundwater technologist

meteorological technicians (2213):

- climate service technician
- aerological technician
- climate data processor
- climate service specialist
- meteorological inspector
- officer-in-charge, weather station
- operations technician, weather station
- port meteorological inspector
- surface weather observer
- avalanche controller
- ice service specialist
- weather service specialist

Education and Training

To work as an *applied chemical technician*, or as a *geological* and *mineral technician* requires completion of an appropriate one- to two-year post secondary program, such as chemical, biochemical or chemical engineering technology, or food, geological, petroleum, petroleum engineering, plastics, groundwater, mining, mining engineering or metallurgy. An additional year of study allows graduates to work as technologists. Some chemical technicians and technologists working in support of fundamental research in chemistry or biochemistry are university graduates. In all cases, certification may be required and available through the Applied Science Technologists and Technicians of British Columbia following two years of supervised work experience.

To enter relevant programs in this field, it is necessary to have completed secondary school, often with good grades in English, mathematics and chemistry.

To work as a *meteorological technician* requires completion of a program provided by the Atmospheric Environment Service and completion of an initial training period of up to one year. Subsequent specialized training is available. Applicants to the program must have completed secondary school.

Several two-year technology programs are available at the British Columbia Institute of Technology (BCIT). Subject areas include Chemical Sciences, Biotechnology, Food, Petroleum and Natural Gas, Plastics Technology and Mining Technology. BCIT also offers a Bachelor of Technology degree in Environmental Engineering Technology.

Okanagan University College offers a general bachelor of science, as well as BSc degrees, with a chemistry or environmental chemistry specialization. Kwantlen University College offers a two-year science diploma with a chemistry specialization as well as an associate degree in science, which represents one half of a bachelor of science degree. Kwantlen also offers a diploma in Environmental Protection Technology. The University College of the Fraser Valley offers a bachelor of science degree with a chemistry minor, as well as an associate degree in science. The University College of the Caribou offers a bachelor of science, with a chemistry or environmental chemistry specialization. Camosun College offers a two-year program in applied chemistry and biochemistry. Transfer into a third year bachelor's degree program is possible upon completion of this diploma. Langara College and Camosun College offer two-year associate science degrees, with a specialization in chemistry.

Okanagan University College offers a diploma program in water quality technology, which consists of four study semesters and three co-op work terms.

In B.C. programs of study involving geology, mineralogy and metallurgy tend to be embedded in courses of study of four years or more at the universities. For instance, the University of British Columbia (UBC) offers a bachelor's degree in engineering with specialization in metallurgy or geology, and the University of Victoria (UVic) incorporates many geology courses into the School of Earth and Ocean Sciences curriculum.

Many individual courses in chemistry and biochemistry can be completed at B.C. colleges and university colleges for credit upon entry into a bachelor's program at most universities and university colleges. The University of Northern British Columbia offers bachelor's degrees in chemistry and in environmental science, with specialization in environmental chemistry.

Technicians and technologists in the physical sciences require an inquiring mind and an aptitude for mathematics and chemistry. They must be able to work well with others, since they are often part of a team, but be able to work independently as well and to take initiative when necessary. Good communication and analytical skills, adaptability, flexibility and comfort with computers usually are necessary also. Good health and physical stamina may be required for field work. Ongoing education is important, and management skills may be helpful.

Working Conditions

People who work in technical occupations in physical sciences are commonly called science technicians and work under a wide variety of conditions. *Applied chemical technologists* and *technicians* and *meteorological technicians* tend to work indoors with scientific equipment (often in laboratories) and have regular hours. Some occasionally work irregular hours to monitor experiments that can't be completed during regular working hours. Others, such as *geological* and *mineral technologists* and *technicians*, perform much of their work outdoors, sometimes in remote locations, and some may be exposed to hazardous conditions. Applied chemical technologists and technicians sometimes work with toxic chemicals, However there is little risk if proper safety procedures are followed.

In 1995 the average annual earnings for all workers in this occupational group were above the provincial average earnings level of $27,900. The average annual earnings were $44,900 for meteorological technicians, $33,100 for geological and mineral technologists and technicians, and $29,300 for applied chemical technologists and technicians. For those who worked full time for the whole year, the average earnings were $53,100 for meteorological technicians, $47,700 for geological and mineral technologists and technicians, and $40,500 for applied chemical technologists and technicians. According to a survey of recent college graduates, the average salary for new geological and mineral technologists and technicians was $2,760 per month ($33,100 per year) and the average salary for new applied chemical technologists and technicians was $2,300 per month ($27,600 per year).

This occupational group experienced modest growth as the number of employed workers rose from 2,490 in 1990 to 2,920 in 1998. About 46% of this group were applied chemical technologists or technicians, 44% were geological or mineral technologists or technicians, and just 10% were meteorological technicians.

Self-employment varies somewhat in this group, with a high of 16% for geological and mineral technologists and technicians and a low of 2% for applied chemical technologists and technicians. Just 12% of the entire group work part time, which is well below the all-occupation average of 26%. The unemployment rate is about the same as the average for all occupations.

These workers are found in a wide range of industries with the overall largest concentration employed in professional business services (31%). The other major industries employing these workers are best described on an individual occupation basis. Applied chemical technologists and technicians tend to work in pulp and paper manufacturing and in food processing. Geological and mineral technologists and technicians tend to work in services incidental to mining and in metal mining. Meteorological technicians tend to work for Environment Canada and in the public transit and other transportation industry. The distribution of these workers is very similar to the distribution of workers in all occupations. For science technicians, 60% are located in the Lower Mainland, 14% on Vancouver Island, 16% in the Okanagan/Kootenay region and 10% in Northern B.C.

Women make up 31% of the workers in the entire group, but their representation varies with the specific occupation. They account for 43% of applied chemical technologists and technicians, but less than 20% of both meteorological technicians and geological and mineral technologists and technicians. Overall, the age distribution of the workers in this occupational group tends to match that of the B.C. workforce. It should be noted however, that 33% of the applied chemical technologists and technicians are between the ages of 25 and 34, compared to only 25% for all occupations. The average ages are 36 for applied chemical technologists and technicians, 40 for geological and mineral technologists and technicians and 43 for meteorological technicians.

Employment Prospects

This is a medium-sized occupational group, made up of about 2,920 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment in this group to grow at an annual rate of 1.9%, faster than the average for all occupations. According to this projection, 1,550 positions will become available from 1998 to 2008. Most of these openings (60%) are projected to result from the need to replace workers who retire, and the remainder will come from growth in the number of new positions.

There are three occupations within this group. Only 10% of the workers in this group are *meteorological technicians*. The remaining 90% of the employment in this group is divided fairly equally between the two occupations of *applied chemical technologists* and *technicians*, and *geological* and *mineral technologists* and *technicians*.

Employment of applied chemical technologists and technicians is projected to grow much faster than the all-occupation average. Consequently over half of the projected openings for this occupational group are for these professionals.

Employment of geological and mineral technologists and technicians is projected to grow about as fast as the average for all occupations and will account for a little less than 40% of the projected openings. The few remaining openings for this occupational group are accounted for by meteorological technicians, and their employment is projected to grow more slowly than the all-occupation average.

It should be noted that industry sources disagree with the much faster than average employment growth projection for applied chemical technologists and technicians. In fact, they suggest that little or no employment growth over the next one to two years in this field is a likely scenario.

Employment growth in these occupations is largely fuelled by activity in mining, pulp and paper, and the chemical industries, although much of the work takes place in the professional business services sector. A smaller contribution to employment growth is expected from education and health.

Laboratories that perform testing and monitoring functions are also expected to be a source of employment growth in this occupational group due to the increased demand for environmental monitoring and developments in biochemistry and related engineering fields. Continued growth of scientific research and development and the production of technical products are also likely to be a source of employment growth for science technicians. Quality control is another field gaining importance as B.C. firms diversify products and markets. There are some labour saving impacts resulting from computer and communications developments, but generally employment opportunities in this field are positively affected by technology. However, there may be fewer conventional jobs as contract work is becoming increasingly frequent, especially in small and medium-sized businesses.

There is considerable mobility among applied chemical technologists and technicians. Advancement to specialist or project leader positions among these professionals is possible with experience. Mobility is also possible among some occupations in the geological sciences group and related fields, such as civil engineering. This is partly because of the similarities between some geophysical technologies and other technologies, such as electronic technology. Mobility for meteorological technicians is extremely limited because these workers are so specialized.

It is essential that professionals in these fields keep abreast of developments within their area of expertise. Periods of retraining and professional development are common for careers in any of these fields. Technicians and technologists who have updated skills and knowledge have an advantage over others in competing for employment opportunities in these fields.

Additional Information

Applied Science Technologists and Technicians of B.C.
http://www.asttbc.org

Related Occupations

applied chemical technologists and technicians (2211):

- biochemistry technologists working as medical laboratory technologists (in 321 medical technologists and technicians (except dental health))
- process technicians who operate the controls of chemical or petrochemical processing plants (in 923 central control and process operators)

geological and mineral technologists and technicians (2212):

- civil engineering technologists and technicians (in 223 technical occupations in civil, mechanical and industrial engineering)
- electrical and electronics engineering technologists and technicians (2241)
- mapping and related technologists and technicians (in 225 technical occupations in architecture, drafting, surveying and mapping)
- supervisors, mining and quarrying (in 822 supervisors, mining, oil and gas)
- supervisors, oil and gas drilling and service (in 822 supervisors, mining, oil and gas)
- technologists and technicians whose primary duties are to perform chemical laboratory tests (in 221 technical occupations in physical sciences)

meteorological technicians (2213):

- meteorologists (in 211 physical science professionals)

To enter relevant programs in this field, it is necessary to have completed secondary school, often with good grades in English, mathematics and chemistry.

Biological Technologists and Technicians

NOC 2221

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	1,300	1,790	2,080

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
290	460	750

Annual Growth 1998-2008	1.5%
Main Industries of Employment	
Fishing and Trapping	23%
Federal Administration	17%
Professional Business Services	15%
Employment by Region	
Lower Mainland	43%
Vancouver Island	34%
Northern B.C.	10%
Okanagan/Kootenay	11%
Self-employment	8%

Nature of the Work

Biological technologists and *technicians* may work independently or provide technical support and services to scientists, engineers and other professionals working in the fields of agriculture, resource management, plant and animal biology, microbiology, cell and molecular biology, and health sciences. They are employed in both laboratory and field settings by governments, manufacturers of food products, chemicals and pharmaceuticals, biotechnology companies, health, research and educational institutions, environmental consulting companies and resource and utilities companies.

Main Duties

Biological technologists and *technicians* conduct biological, microbiological and biochemical tests, and laboratory analyses. These tests and analyses help support quality control in food production, sanitation, pharmaceutical production and other fields.

Workers in this occupational group also do experimental work in agriculture, plant breeding, animal husbandry, biology and biomedical research.

The work of biological technologists and technicians always involves the analysis of data and the preparation of reports. They conduct field research and surveys, collecting data and samples of water, soil, plant and animal populations.

Biological technicians also conduct or supervise operational programs, such as fish hatchery, greenhouse and livestock production programs.

Note that the use of the terms technologist and technician have not become standardized in this field.

©Stone/Vancouver

Example Titles

- bacteriology technician
- microbiology technologist
- plant breeding technician
- microbiology quality control technologist
- seed technologist
- fisheries technician
- biological laboratory technologist
- agricultural technologist
- agricultural technician
- botanical technician
- fish hatchery technician
- aquaculture technician
- food bacteriological technician
- food product technologists

Education and Training

Completion of a technology diploma program in a relevant field, such as agriculture, aquaculture, biology, biotechnology, microbiology or resource management, is normal for people in this field. Some government jobs and academic research positions may require a university degree. Certification with the Applied Science Technologists and Technicians of British Columbia may be required by some employers.

The British Columbia Institute of Technology (BCIT) offers a two-year diploma in biotechnology, and Camosun College offers a two-year diploma in applied chemistry and biochemistry. Transfer into the third year of a bachelor's degree program is possible upon completion of these diplomas. BCIT also offers seminars in biotechnology.

Malaspina University College offers the only two-year diploma in resource management officer technology in the province. Completion of the Conservation Outdoor Recreation Education (CORE) program of the B.C. Ministry of Environment, Lands and Parks is recommended prior to seeking employment.

Kwantlen University College confers a two-year diploma in environmental protection technology, and Camosun College offers a two-year environmental technology diploma. These programs involve cooperative education components. North Island College offers a two-year environmental assessment diploma and an Aquaculture and Fisheries Certificate Program. Langara College offers a two-year diploma in environmental studies.

The University College of the Cariboo offers a Bachelor of Natural Resources Science Degree. Royal Roads University offers a Bachelor of Science in environmental science.

BCIT also offers a one-year, part-time, advanced diploma in integrated resource management for those already working in the field who want to upgrade their management skills while broadening their knowledge of resource management.

Admission requirements to these programs generally include the completion of grade 12 or equivalent, with English, mathematics, biology, chemistry and physics. Upgrading is available at all public colleges and university colleges.

Several institutions offer two-year technology diploma programs in fish, wildlife and recreation. BCIT offers a Fish, Wildlife and Recreation option as one of the Renewable Resources cooperative diploma programs. The Nicola Valley Institute of Technology (NVIT) offers a Natural Resource Technology diploma in fish, wildlife, grassland and recreation. Selkirk College offers a Recreation, Fish and Wildlife Technology Diploma and an optional post-diploma Advanced Certificate in Renewable Resources. Relevant one-year certificate programs may be available, but students are advised to complete the second year to receive a diploma of technology, which is required by most employers. Okanagan University College has a freshwater science bachelor of science program.

Admission requirements for these three programs generally include graduation from grade 12 or equivalent, with English 12, biology 11, mathematics 11 and one science 12.

For a description of the education required to work in the areas of agriculture and aquaculture, refer to the profile Contractors, Operators and Supervisors in Agriculture, Horticulture and Aquaculture (825). For information on biology and microbiology degrees, as well as resource management degree programs, see the profile Biologists and Related Scientists (2121).

Biological technicians and technologists usually require an aptitude for science and mathematics. They must be able to work well with others, since they are often part of a team, but be able to work independently and take initiative when necessary. Good communication and analytical skills, adaptability, flexibility and comfort with computers also usually are necessary. Good health and physical stamina may be required for field work. An enjoyment of the pursuit and advancement of knowledge is an asset, as is an inquiring nature balanced by a logical approach.

F3

Summer employment is often a good way to gain entry into this field. As well, at Malaspina University College there is a two-year technology entrance preparatory program, which may be taken on a full- or part-time basis.

Because training is often quite specific, there tends to be low job mobility between different areas within this field.

Working Conditions

Biological technologists and *technicians* primarily work indoors in a nine-to-five office or laboratory environment, although some outdoor field work is usually required. The nature of the field work varies a great deal within the occupational group, depending on which biological system is involved. Fisheries field work might involve going to sea for extended periods of time. This is a non-standard work arrangement, and it is unlikely to be matched when working in other biological systems, such as agriculture or animal husbandry.

The average earnings for biological technologists and technicians were $26,600 in 1995, about 5% below the provincial average of $27,900. For those workers employed full time for the whole year, average earnings were $40,700, which is slightly higher the all-occupation average of $39,400. However, at average annual earnings of $31,400 for full-time, full-year employment, women in these occupations made on average about $14,000 per year less than their colleagues who are men. According to a survey of recent college graduates, new entrants to the occupation of biological technologists and technicians earned an average of $2,429 per month ($29,100 per year).

This is a medium-sized occupational group that has experienced modest growth. The number of workers has increased from 1,300 in 1990 to 1,790 in 1998. Self-employment (8%) is below the provincial self-employed average of 15%, and at 13%, there are fewer part-time workers than in many other occupations.

The unemployment rate for these occupations is about the same as the average for all occupations. Employer demand is not only sensitive to business conditions over the long run, but it is also affected by seasonal fluctuations. While much lab work continues year round, the intensity of field research and program operations goes up and down with the natural cycle. In agriculture, for instance, most activity will take place during the growing season.

Biological technologists and technicians are employed across a variety of industries. Workers in this group are found in the federal and provincial governments (25%), the fishing industry (23%), professional and other business services (19%), education (11%) and agriculture (8%). Most of the workers are located in the Lower Mainland (44%) and on Vancouver Island (35%). However, these proportions are significantly lower than average for the Lower Mainland and significantly higher than average for Vancouver Island. In addition, those living on Vancouver Island tend to be located outside of the Greater Victoria area, and some are probably associated with the Pacific Fisheries Research Institute in Nanaimo.

Women account for 39% of the workers, which is lower than the average for all occupations (46%). Biological technologists and technicians tend to be younger than average, with 52% of the workers in the 15 to 34 age group compared to 40% for the workforce as a whole. The average age of workers in these occupations is 34.

Employment Prospects

This is a medium-sized occupational group, made up of about 1,790 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment in this group to grow at an annual rate of 1.5%, about as fast as the average for all occupations. According to this projection, 750 positions will become available from 1998 to 2008. Most of these openings (61%) will result from the need to replace workers who retire, and the remainder will come from growth in the number of new positions.

Employment growth for *biological technologists* and *technicians* is closely tied to research and development funding, which comes from both the private and public sector. About one-quarter of the workers in this field are employed in the government sector. As with many other areas, growth in the number of publicly funded positions will continue to be limited by spending restraint. However, the private sector will be a significant source of employment growth. Most opportunities will be in the agriculture, aquaculture and recreation industries. Fishing will also provide some, although limited, employment opportunities as the industry works to sustain fish stocks.

Agricultural technologists who have a good knowledge of the global market situation and who are able to work on a team have an advantage. Workers with skills as promoters and facilitators are sought in the bio-food field. The ability to inspire creativity and innovation, promote initiatives and encourage entrepreneurship is also in demand. Skills in analysis and synthesis, written and oral communication skills, independence and familiarity with the expertise available in the field are major assets for agricultural technologists.

In addition to their technical knowledge, there is demand for technologists who can assess customers' needs as well as adapt and respect their ideas and decisions. Technologists who have developed their customer service, computer and analytical skills, who have an overview of the agri-food industry and who have knowledge in economics and administration will be at an advantage also. The ability and willingness to upgrade skills are essential since agricultural technologists who are consultants must be able to adapt rapidly to new customer needs on an ongoing basis.

Mostly large firms hire food product technologists. Knowledge of quality control, statistical process control, formulation, manufacturing processes and delicatessen meats and bakery products are all useful skills for these workers. Employers also consider computer competence, knowledge of administration (management, marketing, human relations) and a second language to be desirable qualities in these workers.

The number of new technologies appearing in the agri-food industry will require versatility and the ability to adapt and undergo further training (retraining and development courses). Technological changes are gradually affecting the tasks and skill requirements of these workers. Their responsibilities are growing. They must now be able to work on a team, have analytical skills, be creative and know how to communicate. A willingness to move is very important because many jobs are located outside urban centres.

It is useful for workers in this field to keep abreast of developments within their area of expertise. There is limited mobility between occupations in this group because of their specialized knowledge. Periods of retraining and professional development are common for careers in this field. Technicians and technologists who have updated skills and knowledge have an advantage over others in competing for employment opportunities in this field.

Additional Information

Conservation Outdoor Recreation Education (CORE)
http://www.bcwf.bc.ca/core/core.html

Applied Science Technologists and Technicians of B.C.
http://www.asttbc.org

Related Occupations

- conservation and fishery officers (2224)
- forestry technologists and technicians (2223)
- medical laboratory technicians (in 321 medical technologists and technicians (except dental health))
- medical laboratory technologists and pathologists' assistants (in 321 medical technologists and technicians (except dental health))
- biochemistry technologists and technicians, except medical (in 221 technical occupations in physical sciences)
- biomedical engineering technologists (in 2241 electrical and electronics engineering technologists and technicians)

The number of new technologies appearing in the agri-food industry will require versatility and the ability to adapt and undergo further training (retraining and development courses). Technological changes are gradually affecting the tasks and skill requirements of these workers.

Forestry Technologists and Technicians

NOC 2223

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	2,920	3,610	4,230

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
620	940	1,560

Annual Growth 1998-2008 1.6%

Main Industries of Employment

Logging and Forestry	51%
Professional Business Services	18%
Provincial and Territorial Administration	13%

Employment by Region

Lower Mainland	14%
Vancouver Island	23%
Northern B.C.	33%
Okanagan/Kootenay	30%

Self-employment 8%

Nature of the Work

Forestry technologists and *technicians* may work independently or perform technical and supervisory functions in support of forestry research, forest management, forest harvesting and forest resources conservation and protection. They are mostly employed by the forest industry but also by local, provincial and federal governments, consulting firms and other industries and institutions. They may also be self-employed.

Main Duties

Forestry technologists and *technicians* conduct, supervise and participate in forest inventory cruises, surveys and field measurements, following accepted scientific and operational procedures. They assist and perform technical functions in the preparation of forest management and harvest plans using photogrammetric and mapping techniques and computerized information systems. They assist in planning, they supervise construction of access routes and forest roads, and they implement, supervise and perform technical functions in silvicultural operations involving site preparation, planting and tending of tree crops.

They also coordinate activities, such as timber scaling, forest fire suppression, disease or insect control or pre-commercial thinning of forest stands. They supervise and perform technical functions in forest harvesting operations. They monitor activities of logging companies and contractors, and they enforce regulations, such as those concerning environmental protection, resource utilization, fire safety and accident prevention. Further, they provide forestry education, advice and recommendations to woodlot owners, community organizations and the general public.

Example Titles

- cruising technician - forestry
- fire suppression officer - forestry
- forest fire technician
- forest survey technician
- forestry technician
- forestry technologist
- resource officer, forest inventory
- resource technician - forestry
- scaler technician - logging
- silviculture technician
- conservation technician - forestry
- extension ranger - forestry
- enforcement officer - forestry
- forest technician

Education and Training

Completion of a two-year technology diploma program in forestry technology is typical for people who work in this field. Registration with the Applied Science Technologists and Technicians of B.C. may be required by some employers.

Two-year forestry technology programs are available at seven public institutions. These are British Columbia Institute of Technology (BCIT), College of New Caledonia, Malaspina University College, Nicola Valley Institute of Technology, Northwestern Community College, Selkirk College and North Island College. One-year certificates are available at each of these institutions, but students are advised to complete the second year to receive a diploma of technology, which is required for most positions.

Northern Lights College, in partnership with Olds College in Alberta, offers a diploma program in Land and Resource Management. This program provides students with the skills to pursue a wide variety of careers in the oil and gas, forestry and environmental industries. Graduates from this program may continue their studies to obtain a degree in this field through partnerships with the University of Northern British Columbia and Olds College.

BCIT offers part-time training programs of various lengths in response to demand and to assist in upgrading. The College of New Caledonia offers a year-long natural resource management certificate, with a focus on fisheries and forestry. Other colleges also offer a variety of forestry-related courses on an ad hoc basis through their continuing education departments.

Certification and licensing as a log scaler may be required in some positions. Malaspina University College has a five-month program, and North Island College has a four-month program, in Log Scaling. Both prepare students to take the Ministry of Forests written and practical examinations for a scaling licence. Admission requires physical strength and agility, grade 10 (grade 12 is preferred) and proficient mathematical skills.

For more information on technician and technologist programs focusing on fish, wildlife and recreation, see the profile Biological Technologists and Technicians (2221).

Technicians and *technologists* in *forestry* usually require an aptitude for science and mathematics. They must be able to work well with others, since they are often part of a team, but be able to work independently and take initiative when necessary. Good communication and analytical skills, adaptability, flexibility and comfort with computers usually are necessary also. Good health and physical stamina may be required for field work. An enjoyment of the pursuit and advancement of knowledge is an asset, as is an inquiring nature balanced by a logical approach.

Summer employment is often a good way to gain entry into this field. As well, at Malaspina University College there is a two-year Technology Entrance Preparatory Program, which may be taken on a full- or part-time basis.

Working Conditions

Most *forestry technologists* and *technicians* work outdoors in a forest setting at least part of the time. Those who specialize in mapping or computerized information services may be bound mostly to the office. Those involved with scaling (measuring the volume of wood harvested) usually work outdoors, either in the woods or at a company sorting yard. Occasionally forestry technologists and technicians will operate dangerous equipment, such as chainsaws or brushsaws, though not on a regular basis. Workers in these occupations may spend a lot of time driving trucks from site to site. Long work weeks are also common, particularly during peak operating seasons. Working out of remote (live-in) logging camps is now rare, as few such camps are still in operation.

The annual average earnings for all forestry technologists and technicians were $31,600 in 1995, which is higher than the provincial average. Approximately 44% of the workers are employed full time for the whole year, and their earnings averaged $43,600, 11% above the all-occupation average of $39,400. According to a survey of recent college graduates, new entrants to the occupations of forestry technologists and technicians earned an average of $3,030 per month ($36,400 per year).

There were 3,610 workers employed in this medium-sized occupational group in 1998. Forestry technologists and technicians experienced a modest level of growth (24%) involving an increase of 690 workers over the 2,920 people employed in 1990. Self-employment (8%) is much lower than the provincial self-employed average of 15%. At 8%, there are fewer part-time workers than in other occupational groups, which reflects the long hours often required. The unemployment rate is about the same as the average for all occupations.

Working only part of the year is common throughout the forest industry. Logging operations can experience seasonal shut downs during spring breakup (in interior areas), during periods of high snow levels (in coastal areas) or during periods of high fire hazard. For forestry technologists and technicians this situation is reflected in a relatively high proportion of workers who are employed full time but for only part of the year (48%).

Just over half (51%) of forestry technologists and technicians are employed in logging and forestry. Workers in these occupations are also employed in professional business services (18%), the provincial government (13%) and wood manufacturing (8%). These occupations are focused on logging and forest operations, and it is not surprising that workers tend to live in areas away from the Lower Mainland and Victoria. The areas with the largest concentration of workers are Northern B.C. (33%), the Okanagan/Kootenay region (30%) and Vancouver Island (23%). Only 14% of the workers live in the Lower Mainland, compared to 57% of the workers in the workforce as a whole.

Traditionally this has been an occupation dominated by men. Women represent only 20% of those who work as forestry technologists and technicians. In addition, a lower proportion of these women tend to work full time, full year (29%), while a higher proportion work full time, part year (57%). The comparable proportions for men are 48% and 46% respectively. Finally, the annual average earnings for women who work full time, full year are $36,400, or about $8,200 less than the average for men in these occupations.

Workers in these occupations tend to be somewhat younger, in part reflecting the outdoor, physical nature of the work. About 52% of the workers are in the age group of 15 to 34, compared to 40% for the workforce as a whole. The average age of forestry technologists and technicians is 35.

Employment Prospects

This is a medium-sized occupational group, made up of about 3,610 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment in this group to grow at an annual rate of 1.6%, about as fast as the average for all occupations. According to this projection, 1,560 positions will become available from 1998 to 2008. Only about 40% of these openings are projected to come from growth in the number of new positions. The remainder will come from the need to replace workers who retire.

Research funds devoted to forestry management and other forestry research have increased in response to a growing public concern for environmental issues. This funding will provide a significant source of employment growth for these workers. The development and protection of forestry areas and the development of new forestry methods and products are being funded through FRBC (Forestry Renewal British Columbia) from dedicated funding collected from industry fees. These developments will provide many of the opportunities for these workers. These opportunities are often contract- or project-based positions rather than conventional full-time, full-year work. Government restraint will continue to restrict employment growth in the public sector.

Over half of these workers are employed in the forest and forest manufacturing industry, where employment is expected to grow more slowly than the all-industry average through to 2008. According to industry sources, several contributing factors will result in the need for fewer but more highly skilled workers in this industry. Among these factors are global consumer pressures for higher quality and more environmentally responsible forest products. A reduction in the available supply of wood, fibre and wood chips, along with advances and changes in technology, will further reduce the employment demand for workers in this industry. Global competition and changing product markets by Asian buyers of coastal B.C. wood will also have a negative impact on employment in this industry. However, these negative employment factors will affect mainly the less-skilled workers. The main effect on workers with relatively higher skills, such as *forestry technologists* and *technicians*, will be to increase their skill requirements.

One source of uncertainty with the forecast for this group is the renegotiation of the import restrictions that have been imposed recently by the U.S. softwood lumber agreement. The uncertain outcome of this agreement will have a significant employment impact for workers in the forestry industry.

It is essential that workers in these fields keep abreast of developments within their area of expertise, particularly in areas such as biotechnology, genetics, geomatics, remote sensing and computers in general. Periods of retraining and professional development are common for careers in any of these fields. Technicians and technologists who have updated skills and knowledge have an advantage over others in competing for employment opportunities in these fields.

Forestry technologists and technicians may be able to move to occupations in natural resource and wildlife management as well as to supervision and parks management occupations.

Additional Information

WWW Virtual Library: Forestry
http://www.metla.fi/info/vlib/Forestry

Applied Science Technologists and Technicians of B.C.
http://www.asttbc.org

Forestry Renewal B.C. *http://www.forestrenewal.bc.ca*

Ministry of Forests *http://www.gov.bc.ca/for*

Related Occupations

- biological technologists and technicians (2221)
- conservation and fishery officers (2224)
- foresters and forest engineers (in 2122 forestry professionals)

Workers in these occupations tend to be somewhat younger, in part reflecting the outdoor, physical nature of the work.

Conservation and Fishery Officers

NOC 2224

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	740	780	710

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
-70	170	100

Annual Growth 1998-2008	-0.9%

Main Industries of Employment

Provincial and Territorial Administration	43%
Federal Administration	35%
Fishing and Trapping	10%

Employment by Region

Lower Mainland	22%
Vancouver Island	32%
Northern B.C.	30%
Okanagan/Kootenay	18%

Self-employment	0%

Nature of the Work

Conservation and *fishery officers* enforce the federal and provincial regulations established for the protection of fish, wildlife and other natural resources, and they collect and relay information on resource management. They are employed by federal and provincial government departments.

Main Duties

Conservation and *fishery officers* generate public awareness of fish and wildlife conservation and regulations and conduct patrols by truck, aircraft, boat or on foot to ensure compliance with the provincial and federal statutes relating to fish, wildlife and the environment. These officers investigate complaints, arrest violators, prepare briefs and present evidence in court, issue licences, export documents and special permits, and collect royalties assessed on fish, wildlife and timber resources. Further, they implement and supervise approved techniques in preventing or overcoming damage caused by wildlife. They also perform resource protection duties. They gather resource data by making inventories of fish, collecting water samples and assisting biologists in scientific research, and they conduct public relations activities, including dealing with diverse groups within the public, such as advocates and critics of government programs.

Example Titles

- conservation officer
- fish and wildlife officer
- park ranger
- game warden
- game officer
- fishery officer
- forest ranger, wildlife management

Education and Training

Completion of a two-year college technology diploma program in renewable resources management is typical for people who work as *conservation* and *fishery officers*. Some on-the-job training and courses related to law enforcement and resource management are usually provided as well. Special licences for use of fire arms, explosives, pesticides and motor vehicles may be required for some positions.

The Resources Management Officer Technology program offered by Malaspina University College provides directly related training for conservation officers. Admission requirements include graduation from grade 12 or equivalent, with English 12, mathematics 12, biology 11 (biology 12 recommended) and chemistry 11. The Conservation Outdoor Recreation Education (CORE) program, offered by the Ministry of Environment, Lands and Parks, is recommended prior to application to the program.

The two-year Fisheries and Aquaculture Technology program at Malaspina University College prepares students for positions as fisheries officers. Admission requirements include grade 12 graduation or equivalent, with English 12, mathematics 12 and chemistry 11. Biology 12 is recommended. Malaspina University College also offers a Bachelor of Science degree in Fisheries and Aquaculture.

Graduates of the two-year renewable/natural resources technology programs (fish, wildlife and recreation option) offered by British Columbia Institute of Technology and Nicola Valley Institute of Technology also may be prepared to work as conservation or fisheries officers. Some additional training in the acts and regulations in B.C. may be required for conservation officers. Admission to these programs generally includes graduation from grade 12 or equivalent, with English 12, mathematics 11 and two sciences.

Technicians and technologists in this field must be able to work well with others, since they are often part of a team, but be able to work independently and take initiative when necessary. Good communication and analytical skills, adaptability, flexibility and comfort with computers usually are necessary also. Good health and physical stamina may be required for field work. Summer employment is often a good way to gain entry into this type of work.

Working Conditions

Conservation and *fishery officers* work outdoors in forested and wildlife areas and along rivers, streams and coastal waterways. Considerable office work is also required to maintain records and habitat data. Hours can be very long, especially during fisheries openings or the hunting season.

The annual average earnings for all B.C. fishery and conservation officers were $33,400 in 1995, about 20% above the all-occupation average of $27,900. Approximately 56% of the officers worked full time, full year, and their estimated average annual earnings were $44,600, which is about 13% above the provincial average for all occupations. According to a survey of recent college graduates, new entrants to these occupations earned an average of $2,510 per month ($30,100 per year).

There were an estimated 780 fishery and conservation officers working in B.C. in 1998, only slightly more than the 740 workers employed in 1990. Since government is the only employer of fishery and conservation officers, there is virtually no opportunity for self-employment in these occupations. At just 5%, there are very few part-time workers in this field, both because of government hiring practices and the long outdoor hours that "come with the territory" of wildlife regulation enforcement. The seasonal nature of the work is associated with the large portion of part-year workers in this field. About 39% of fishery and conservation officers are employed full time, part year, which is much higher than the all-occupation average (27%). It is also very high for a "government" job. The unemployment rate is about the same as the average for all occupations.

Under the classification system used for this publication, this occupational group is limited to those workers hired by government to enforce fishery and wildlife regulations. So even though the 1996 Census reported that fishery and conservation officers were working in several industries besides the provincial government (43%) and the federal government (35%), the workers employed in these other industries listed in the Summary Numerical Table are considered to be working in closely related occupations (see Related Occupations section).

As with other occupations where government is the main employer, demand for fishery and conservation officers is dampened by cutbacks in government spending.

Most fishery and conservation officers are located on Vancouver Island (32%), in Northern B.C. (30%) and in the Lower Mainland (22%). This distribution by area differs significantly from the distribution of the workforce as a whole, where 57% are concentrated in the Lower Mainland.

There are far fewer women (21%) than men in these occupations. While more women are interested in pursuing resource management careers than before, the low level of new hiring suggests that these occupations will remain dominated by men for some time. While there are slightly more workers aged 25 to 44 in this field (59%) compared to the workforce as a whole (53%), there are fewer workers aged 15 to 24 (5%) compared to the all-occupation average (15%). This condition may reflect a preference for a minimum level of maturity in workers who will be employed in the environment of regulation enforcement. The average age for fishery and conservation officers is 39.

Employment Prospects

This is a very small occupational group, made up of only about 780 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment in this group to decline to 710 by the year 2008. Despite this, 170 openings are projected to become available to replace workers who retire.

Policies at all levels of government aimed at reducing spending are responsible for the decline in employment projected for *conservation* and *fishery officers*. Government employs almost all of these workers. The growing public concern over environmental issues, such as the need to protect fish and other wildlife, may eventually cause governments to increase their employment of these workers. The need for fisheries development and conservation work also is of major concern to the fishing industry. New ways to monitor and ensure that regulations are met are being developed that place more responsibility in the hands of the industry.

The few openings there are currently in these occupations are mostly filled by people who transfer from other government positions. Advancement to senior and supervisory positions is possible with experience.

Additional Information

Conservation Outdoor Recreation Education
http://www.bcwf.bc.ca/core/core.html

Related Occupations

- biological technologists and technicians (2221)
- forestry technologists and technicians (2223)

Landscape and Horticulture Technicians and Specialists

NOC 2225

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	2,550	2,480	2,680

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
200	620	820

Annual Growth 1998-2008	0.8%
Main Industries of Employment	
Construction	71%
Agriculture	7%
Local and Other Administration	5%
Employment by Region	
Lower Mainland	56%
Vancouver Island	23%
Northern B.C.	2%
Okanagan/Kootenay	19%
Self-employment	35%

Nature of the Work

Landscape and *horticultural technicians* and *specialists* survey and assess landscapes, draw sketches and build models of landscape designs, and construct and maintain gardens, parks, golf courses and other landscaped environments. In addition, they advise clients on issues related to horticulture. They breed, cultivate and study plants, analyse forest growth and treat injured and diseased trees and plants.

Workers in this occupational group have a shared expertise in plant biology. Beyond that, the industries they work in and the job duties they perform can be quite different from worker to worker. They are employed by landscape designers and contractors, lawn service and tree care establishments, golf courses, nurseries and greenhouses, and municipal, provincial and national parks, or they may be self-employed.

Main Duties

Arborists and *tree service technicians* examine trees and shrubs to diagnose problems and disease, and apply various treatments, such as pruning, spraying, repairing damaged areas and injecting with treatment solution. Certified arborists also have an excellent understanding of the delicate soil and water relationships that affect plant health.

Golf course superintendents direct crews that maintain the health and appearance of golf courses and their surrounding landscapes. They plant and move trees, and they apply fertilizers, fungicides, herbicides and pesticides.

Horticulturists plan and coordinate the growth and use of plants for landscaping, ornamental uses and other purposes, including greenhouse production of vegetables.

Landscape designers and *landscape architectural technicians* and *technologists* survey and assess sites, prepare drawings, sketches and reports, and perform other duties to assist landscape architects in designing landscaped environments.

Landscape gardeners plant and maintain private and public lawns and gardens.

Landscapers plan and construct landscaped environments that may include trees, shrubberies, lawns, fences, decks, patios and other landscape structures.

Lawn care specialists visit clients, assess the health of lawns, and apply fertilizer, pesticides and other lawn care products.

©Stone/Vancouver

Example Titles

- apprentice arboriculturist, urban forestry
- apprentice landscape horticulturist
- apprentice utility arborist
- landscape technician
- landscape architectural technician
- lawn care specialist
- landscaper
- golf course superintendent
- hydroponics technician
- landscape specialist
- horticulture specialist
- tree service technician
- horticulturist
- arborist
- horticultural technician
- silviculturist *
- landscape gardener

*note that in British Columbia, the title "silviculturist" refers to a forester (in NOC 2122 *forestry professionals*) who specializes in tree growth.

Education and Training

Completion of a post secondary diploma or degree in a relevant field, such as agronomy, arboriculture, forestry, horticulture, landscaping, landscape design or technology or silviculture, is typical for persons employed in this field. Experience as a landscape and grounds maintenance worker may be required for some positions, and special licences for application of pesticides and other chemicals may be required.

Horticulture Certificate programs are offered at Camosun College, Capilano College, College of the Rockies, Kwantlen University College, Malaspina University College, University College of the Cariboo, Okanagan University College and the University College of the Fraser Valley. Programs range between nine months and a year in duration.

Horticulture Technician programs are similar but each is unique. For example, the program offered by the College of the Rockies offers courses in the tree fruits industry, whereas the one-year program at Kwantlen specializes in greenhouse vegetables or landscape maintenance. Admission requirements include that students must be at least 18 years of age and have completed grade 11.

Many of the courses within these one-year programs are transferable to two-year diploma programs, but it is best to clarify details before undertaking a course with expectations of transferring after one year.

Two-year horticulture diploma programs are offered at Kwantlen University College, University College of the Cariboo and University College of the Fraser Valley (UCFV). Kwantlen's program has four options including landscape design, turf management, greenhouse and nursery production, and general horticulture studies. UCFV offers a general Horticulture Diploma as well as a certificate program for integrated pest management. University College of the Cariboo creates a horticulture/business diploma by offering students one year of business courses after the certificate program in horticulture is complete. Graduates of these programs, with some experience, are able to assume supervisory and managerial roles. Admission to these programs requires grade 12, and previous horticultural experience is an asset.

Apprenticeships are currently available in Landscape Horticulture, Production Horticulture and Arboriculture. Recommended prerequisite education for these apprenticeships is grade 10 or equivalent, with English, mathematics and science, although grade 12 is preferred by most employers. These apprenticeships are four years long and include six weeks of in-school technical training each year at the B.C. Horticulture Centre at Kwantlen University College. Completion of an entry-level training program may confer credit towards some of the required technical training.

For people who have worked for a long time in one of these trades but have never completed an apprenticeship, a Certificate of Qualification is available. The certificate is awarded following submission of evidence of six years' full-time experience in the trade, plus successful completion of an exam. Current details regarding these apprenticeships can be obtained by contacting the Industry Training and Apprenticeship Commission.

For people in the tree care industry, the International Society of Arboriculture (ISA) offers a certificate through their Pacific Northwest Chapter based in Seattle. People with three years of tree care experience are eligible to write the examination, which tests knowledge about tree and pest identification, tree care, disease, pruning and climbing. Upon successful completion of the examination, one can advertise using the term "Certified Arborist." Continuing education every three years is required to maintain certification. ISA offers continuing education seminars in Victoria and Vancouver annually.

Relevant undergraduate degree programs in biology with a focus on plant science are available at each public university in B.C. Undergraduate degree programs in agriculture are offered at the University of British Columbia and include an agroecology program with a horticulture focus. Simon Fraser University also offers a master's degree in pest management. Admission to these university programs requires graduation from high school, with a strong background in English, mathematics and biology. For specific admission requirements, see the calendar for the institution offering the program.

For a description of educational programs in forestry and silviculture, see Forestry Professionals (2122) and Forestry Technologists and Technicians (2223). For a description of educational programs for landscape architects, see Architects, Urban Planners and Land Surveyors (215).

Workers in this field need to be able to work well with others, since they may work at times as part of a team, but they must also be able to work independently and take initiative when necessary. Good communication skills, as well as adaptability and flexibility, are often important. Good health and physical stamina may be required for field work.

Summer employment is often a good way to gain entry into these fields. As well, at Malaspina University College there is a two-year Technology Entrance Preparatory Program, which may be taken on a full- or part-time basis.

Working Conditions

Landscape and *horticultural technicians* and *specialists* work outdoors or in a greenhouse environment for at least part of the time. They may sometimes operate dangerous equipment, such as chainsaws or chippers, though not on a regular basis.

The annual average earnings for all landscape and horticultural technicians and specialists in 1995 were $21,500, 23% below the all-occupation average of $27,900. Only 32% of the workers were employed full time for the full year, compared to 47% for the workforce as a whole. A high proportion of seasonal work contributes to the lower level of the average annual earnings. Those who did work full time, full year in 1995 earned on average $33,000, which is still 16% below the provincial average of $39,400. According to a survey of recent college graduates, new entrants to these occupations earned an average of $2000 per month ($24,000 per year).

There were about 2,480 workers employed in this group as of 1998, only slightly less than the 2,550 who worked in 1990. Self-employment, at 35%, is more than double the provincial self-employment average of 15%. At 23%, the level of part-time work for this group is just below the all-occupation average (26%). The unemployment rate is lower than the average for all occupations.

As mentioned, this field has a much higher than average amount of seasonal work. About 65% of landscape and horticultural technicians work either full time, part year or part time, part year, which compares to just 45% for the the workforce as a whole. Throughout the year, some of the factors that influence employers' needs for landscape and horticultural technicians are the same as those that affect how many houses are built. These include such factors as interest rates, consumer confidence and the price of materials. In addition, a snow cover and a dormant winter season for a wide variety of plants restrict landscaping activity in many areas of the province.

Landscape and horticultural technicians and specialists are mainly employed in construction (71%), in local government (5%), in agriculture (7%) and in amusement and recreational services (5%). Most workers are located in the Lower Mainland (56%) and on Vancouver Island (23%). These proportions are close to those representing the total workforce. However, with 19% of the workers, the Okanagan/Kootenay region is slightly overrepresented, and with 2% of the workers, Northern B.C. is underrepresented.

There are fewer women (28%) in this group than in other occupations. Only 17% of the women are employed full time, full year, and they earn about 24% less than their male counterparts. This tends to be a part-time occupation for women. About 43% of the women work part time, compared to 17% for the men.

While the age distribution tends to follow that for all occupations, there are more workers aged 35 to 44 (36%) compared to the workforce as a whole (28%). The average age for landscape and horticulture technicians and specialists is 38.

Employment Prospects

This is a medium-sized occupational group, made up of about 2,480 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment in this group to grow at an annual rate of 0.8%, slower than the average for all occupations. According to this projection, 820 positions will become available from 1998 to 2008. Three-quarters of these openings will result from the need to replace workers who retire. The remainder will come from growth in the number of new positions.

Most of these projected openings are expected to come from growth or retirement in the construction industry, which currently employs about 70% of these workers. Housing construction is just starting to recover after hitting all-time lows in 1998. However, according to industry sources, this growth in housing construction is more likely to be a short-term phenomenon. The growing number of homeowners who renovate their homes and gardens will offer *horticultural technicians* some opportunities in self-employment.

Expansion of recreational services, such as golf courses, and the growing greenhouse production and silviculture needs also will be sources of employment growth for these workers. However, policies at all levels of government aimed at reducing spending will restrict this growth. Governments do not undertake as much elaborate park development as they did in the past.

It is useful for workers in this field to keep abreast of developments within their area of expertise. Periods of retraining and professional development are common for workers in this field. *Landscape* and *horticultural technicians* and *specialists* who have updated skills and knowledge have an advantage over others in competing for employment opportunities in this field.

Additional Information

B.C. Landscape and Nursery Association
http://www.canadanursery.com/bclna/index.shtml

Pacific Northwest Chapter, International Society of Arboriculture *http://www.teleport.com/~pnwisa*

International Society of Arboriculture (ISA)
http://www2.champaign.isa-arbor.com

Industry Training and Apprenticeship Commission
http://www.itac.gov.bc.ca

Related Occupations

- biological technologists and technicians (2221)
- forestry technologists and technicians (2223)
- landscaping and grounds maintenance contractors and managers (in 825 contractors, operators and supervisors in agric/hort/aqua)
- nursery and greenhouse operators and managers (in 825 contractors, operators and supervisors in agric/hort/aqua)
- nursery and greenhouse workers (in 843 agriculture and horticulture workers)
- supervisors, landscape and horticulture (in 825 contractors, operators and supervisors in agric/hort/aqua)
- botanists (in 2121 biologists and related scientists)
- forester (in 2122 forestry professionals)

Technical Occupations in Civil, Mechanical and Industrial Engineering

NOC 223

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	3,960	5,020	5,610

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
590	540	1,130

Annual Growth 1998-2008	1.1%
Main Industries of Employment	
Construction	29%
Professional Business Services	20%
Wholesale Trade	5%
Employment by Region	
Lower Mainland	63%
Vancouver Island	17%
Northern B.C.	6%
Okanagan/Kootenay	14%
Self-employment	15%

Nature of the Work

Civil engineering technologists and *technicians* may work independently or provide technical support and services in civil engineering in fields such as structural engineering, municipal engineering, construction design and supervision, highways and transportation engineering, water resources engineering and geotechnical engineering. They are employed by consulting engineering and construction companies, public works, transportation and other government departments and in many other industries.

Mechanical engineering technologists and *technicians* may work independently or provide technical support and services in mechanical engineering fields, such as the design, development, maintenance and testing of machines, components, tools, heating and ventilating systems, power generation and power conversion plants, and manufacturing plants and equipment. They are employed by consulting engineering, manufacturing and processing companies, institutions and government departments.

Industrial engineering and *manufacturing technologists* and *technicians* may work independently or provide technical support and services in the development of production methods, facilities and systems, and in the planning, estimating, measuring and scheduling of work. They are employed by manufacturing and insurance companies, government departments and in other industries.

Construction estimators analyse costs and prepare estimates on civil engineering, architectural, structural, electrical and mechanical construction projects. They are employed by residential, commercial and industrial construction companies, and by major electrical, mechanical and trade contractors.

Main Duties

Civil engineering technologists develop engineering designs and drawings from preliminary concepts and sketches and they prepare construction specifications, cost and material estimates, project schedules and reports. They also supervise or conduct field surveys, inspections or technical investigations of topography, soils, drainage and water supply systems, road and highway systems, buildings and structures to provide data for engineering projects. Further, they conduct or supervise inspection and testing of construction materials, and they may supervise, monitor and inspect construction projects.

Civil engineering technicians assist in developing engineering specifications and drawings, and they participate in field surveys, inspections or technical investigations of topography, soils, drainage and water supply systems, road and highway systems, buildings and structures to provide data for engineering projects. They also perform other technical functions in support of civil engineering activities.

Mechanical engineering technologists prepare engineering designs, drawings and specifications for machines, components and power transmission systems. In addition, they process piping, heating, ventilating and air-conditioning systems and prepare cost and material estimates, project schedules and reports. They conduct tests and analyses of machines, components and materials to determine their performance, strength, response to stress and other characteristics. They design moulds, tools, dies, jigs and fixtures for use in the manufacturing process, and they inspect mechanical installations and construction. They also prepare contract and tender documents. They supervise, monitor and inspect mechanical installations and construction projects. They prepare standards and schedules, and they supervise mechanical maintenance programs or operations of mechanical plants.

Mechanical engineering technicians assist in preparing engineering design, drawings and specifications and carry out a limited range of mechanical tests and analyses of machines, components and materials. They assist in the design of moulds, tools, dies, jigs and fixtures for use in the manufacturing process and assist in inspection of mechanical installations and construction projects. They participate in the installation, repair and maintenance of machinery and equipment.

Industrial engineering and *manufacturing technologists* develop and conduct production, inventory and quality assurance programs in manufacturing or in other industries, and they design plant layouts and production facilities. They also develop and carry out work study and related programs as well as industrial health, safety and fire prevention plans and programs. They conduct safety training programs and develop computer applications for the control of robots, numerical control machines and manufacturing processes and operations. They may specialize in the development of production processes, quality assurance programs, plans and schedules in a particular industrial area, such as metal fabrication, plastics, pulp and paper or textile manufacturing.

Industrial engineering and *manufacturing technicians* assist in the design of plant layouts and conduct work measurement or other studies. They also collect and compile operational or experimental data and assist in the development of estimates, schedules, specifications and reports. In addition, they collect and analyse data and samples in support of quality assurance and industrial health and safety programs, develop manufacturing and processing procedures and variables, set machine or equipment controls, oversee production and inspect processes.

Construction estimators analyse costs and prepare estimates on civil engineering, architectural, structural, electrical and mechanical construction projects. They are employed by residential, commercial and industrial construction companies and major electrical, mechanical and trade contractors.

Example Titles

civil engineering technologists and technicians and construction estimators (2231):

- bridge design technician
- building materials technician
- construction technologist
- foundation technologist
- municipal engineering assistant
- soil technologist, civil engineering
- specification writer, construction
- structural design technologist
- structural investigator
- civil engineering technologist
- civil engineering technician
- highway technician
- chief estimator - construction
- principal estimator - construction
- quantity surveyor - construction
- cost estimator - construction

mechanical engineering technologists and technicians (2232):

- aeronautical technologist
- heating designer

- tool designer
- mechanical technologist
- thermal station technician
- tool and die designer
- marine engineering technologist
- mechanical engineering technologist
- mould designer
- mechanical engineering technician
- machine designer
- HVAC technologist

industrial engineering and manufacturing technologists and technicians (2233):

- loss prevention technologist
- manufacturing technologist
- planning technician
- scheduling technician, manufacturing
- quality assurance technologist
- textile technologist
- industrial engineering technologist
- industrial engineering technician
- numerical control tool programmer
- time study analyst
- plastics manufacturing technician
- pulp and paper manufacturing technologist
- manufacturing technician

Education and Training

With the exception of *construction estimators*, completion of a one- to two-year post secondary program is necessary in order to work in these fields as a technician, and an additional year of study is required in order to work as a technologist. Appropriate programs include civil, mechanical or industrial engineering technology, as well as pulp and paper, plastics, textile and manufacturing technology. Construction estimators generally require completion of secondary school and either a civil engineering diploma in construction technology or several years' experience as a salesperson or trades person in a construction trade, such as plumbing, carpentry or electricity.

Certification through a provincial or national association such as the Applied Science Technologists and Technicians of British Columbia may be required for some positions. This generally requires a two-year period of supervised work experience following formal training.

Individual courses in these areas are available at many colleges and university colleges.

Okanagan University College has a two-year Civil Engineering Program and a Mechanical Engineering Technology Diploma. A familiarity with computers is recommended for those applying to these programs. Camosun College has a Civil Engineering Technology program that takes two and a half years to complete, as well as a Mechanical Engineering Technology program. All programs are two years in length.

Graduates of the Civil Engineering Technology program who complete a six-month bridge program at Camosun College may transfer directly into the third year of a bachelor's program in Civil Engineering at the University of British Columbia.

Graduates of the Mechanical Engineering Technology program who complete a six-month bridge program at Camosun College may transfer directly into the third year of the Mechanical Engineering bachelor degree program at the University of Victoria. See the profile Civil, Mechanical, Electrical and Chemical Engineers (213) for details about degree programs.

The University College of the Cariboo offers a diploma in Engineering Design and Drafting Technology that equips graduates with skills needed to work in technological positions in building, civil and mechanical design, project construction and construction management. The College of New Caledonia offers a technology diploma in engineering design that provides graduates with training in engineering design with an emphasis on building design.

The British Columbia Institute of Technology (BCIT) offers diplomas in Civil and Structural Technology, Building Engineering Technology, Mechanical Engineering Technology and Plastics Technology. Prerequisite education for all these programs is grade 12 or equivalent, with mathematics and English.

BCIT also has a full-time bachelor of technology in Construction Management that provides graduates with management and leadership skills needed to make effective management decisions and lead construction operations.

Some colleges and university colleges in B.C. offer technology access programs, to allow students to upgrade prior to entrance into a technology program.

To be successful at this type of work requires skill at reading blueprints, mathematics and computer skills, communication and negotiation skills, and up-to-date knowledge of bylaws, building codes and laws that deal with bidding procedures, contracts and insurance.

Working Conditions

Most people in *technical occupations* in *civil, mechanical* and *industrial engineering* work regular hours in laboratories, offices, electronics and industrial plants or on construction sites. Some may be exposed to hazards from equipment, chemicals or toxic materials. Work is usually interesting and challenging and provides an ongoing learning environment.

In 1995 the average annual earnings for all workers in this occupational group were $41,500, with the 66% who worked full-time for the whole year receiving an average of $48,200 in earnings. There was not much variation in the average earnings for each of the occupations within this group. The comparable all-occupation averages in the province in 1995 were significantly lower, at $27,900 and $39,400 respectively.

According to a survey of recent college graduates, those who found work as *civil engineering technologists* and *technicians* reported average monthly earnings of $2,660 ($31,900 per year). The average monthly earnings reported for the other occupations were $2,720 ($32,600 per year) for *construction estimators*, $2,750 ($33,000 per year) for *mechanical engineering technologists* and *technicians*, and $2,830 ($34,000 per year) for *industrial engineering* and *manufacturing technologists* and *technicians*.

Almost two-thirds (59%) of the workers in this occupational group are either civil engineering technologists, civil engineering technicians or construction estimators. Mechanical engineering technologists and technicians make up 26% of the group, and industrial engineering and manufacturing technologists and technicians account for 15%. The total number of employed workers in this group rose by 27%, from 3,960 in 1990 to 5,020 in 1998. Almost half of this growth involved civil engineering technologists and technicians and construction estimators.

The rate of self-employment among workers in these occupations varies somewhat. About 18% of civil engineering technologists and technicians and construction estimators are self-employed. For mechanical engineering technologists and technicians, the level is 13%. However, only 6% of the industrial engineering and manufacturing technologists and technicians are self-employed. There has been an increase in the number of temporary or contract jobs available, to the detriment of permanent jobs. The amount of sub-contracting work is also increasing. About 7% of this group work part time.

Unemployment for the four occupations in this group is lower than the average for all occupations. About 32% of the workers are employed for only part of the year, but seasonality is not considered to be an important factor in this occupational group.

The industries that employ the largest concentrations of workers in this group are construction (29%) and professional business services (20%). Other employers of these workers include wood manufacturing, metal fabrication manufacturing, wholesale trade and transportation. About 63% of these workers are located in the Lower Mainland, while 17% are on Vancouver Island, 14% are in the Okanagan/Kootenay region, and 6% are in Northern B.C.

As is the case in many engineering-related occupations, the majority of workers in this group are men. Women account for only 11% of this entire group. The age distribution of this group is fairly close to the all-occupation average, except for a somewhat lower representation among those aged 15 to 24, which could be expected given the educational and training requirements for these positions. The average age is 41.

Employment Prospects

This is a large occupational group, made up of about 5,020 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment in this group to grow at an annual rate of 1.1%, slower than the average for all occupations. According to this projection, 1,130 positions will become available from 1998 to 2008. A little over half of these openings will result from growth in the number of new positions, and the remainder will come from the need to replace workers who retire. Some additional openings will come from the high worker turnover of junior technologists and technicians.

The sizes and employment projections of the three occupational unit groups within this overall occupational group differ. Employment of *civil engineering technologists* and *technicians* and *construction estimators* is projected to grow more slowly than the average for all occupations. However, employment in both the other unit groups is projected to grow faster than the average for all occupations.

Only 260 openings are projected to become available for *industrial engineering* and *manufacturing technologists* and *technicians* over the projection period. However, 440 openings are projected for civil engineering technologists and technicians and construction estimators. An equal number of openings (440) is projected for *mechanical engineering technologists* and *technicians*.

Most employment openings through to the year 2008 will come from growth in the construction and professional business services industries. Combined, these industries employ about half of all of these workers in B.C. Employment prospects in these occupations are also dependent on the state of the economy and are vulnerable to investment changes and government restraint.

According to industry sources, there is a current and persistent shortage of construction estimators. This situation should make it easier for qualified graduates to penetrate the job market. Smaller companies need employees who are qualified estimators and who can serve also as project managers or schedulers. The job of construction estimator is largely an entry-level position. However, advancement to more senior project management positions is possible with experience.

Sustained competitiveness in a knowledge-based global economy requires vigorous and ongoing commitment to scientific and technological innovation. For this reason, it is particularly useful for workers to keep abreast of developments within their area of expertise. Periods of retraining and professional development are common for these workers. Those who have updated skills and knowledge have an advantage over others in competing for employment.

Additional Information

Quantity Surveyors Society of B.C. (contains information on the occupation of *construction estimators*)
http://www.qssbc.org

Applied Science Technologists and Technicians of B.C.
http://www.asttbc.org

For more information on computer-related occupations, see the *Information Technology Occupations* section in the *Introduction to Work Futures*.

Related Occupations

civil engineering technologists and technicians (2231):

- architectural technologists and technicians (in 225 technical occupations in architecture, drafting, surveying and mapping)
- construction inspectors (in 226 other technical inspectors and regulatory officers)
- construction managers (in 01/09 middle and other management)
- drafting technologists and technicians (in 225 technical occupations in architecture, drafting, surveying and mapping)
- survey technologists and technicians (in 225 technical occupations in architecture, drafting, surveying and mapping)

mechanical engineering technologists and technicians (2232):

- contractors and supervisors, trades and related workers (721)
- drafting technologists and technicians (in 225 technical occupations in architecture, drafting, surveying and mapping)
- industrial designers (in 225 technical occupations in architecture, drafting, surveying and mapping)
- managers in manufacturing and utilities (in 01/09 middle and other management)
- technical sales specialists, wholesale trade (6221)

industrial engineering and manufacturing technologists and technicians (2233):

- technical sales specialists, wholesale trade (6221)
- textile technologists/technicians working in support of chemical dyeing and finishing and quality control technologists/technicians in food or chemical industries or laboratories (in 221 technical occupations in physical sciences)

construction estimators (2234):

- civil engineers (in 213 civil, mechanical, electrical and chemical engineers)
- construction managers (in 01/09 middle and other management)

To be successful at this type of work requires skill at reading blueprints, mathematics and computer skills, communication and negotiation skills, and up-to-date knowledge of bylaws, building codes and laws that deal with bidding procedures, contracts and insurance.

Electrical and Electronics Engineering Technologists and Technicians

NOC 2241

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	2,140	3,920	4,650

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
730	320	1,050

Annual Growth 1998-2008 1.7%

Main Industries of Employment

Electrical and Electronic Products	19%
Professional Business Services	14%
Electric Power Utilities	11%

Employment by Region

Lower Mainland	67%
Vancouver Island	17%
Northern B.C.	7%
Okanagan/Kootenay	8%

Self-employment 6%

Nature of the Work

Electrical and *electronics engineering technologists* and *technicians* may work independently or provide technical support and services in the design, development, testing, production and operation of electrical and electronic equipment and systems. They are employed by electrical utilities, communications companies, manufacturers of electrical and electronic equipment, consulting firms, governments and a wide range of manufacturing, processing and transportation industries.

Main Duties

Electrical and *electronics engineering technologists* and *technicians* design, develop and test power equipment and systems, industrial process control systems, telecommunication, broadcast, recording and audiovisual systems, microelectronic systems and circuits, computers, computer systems and networks and computer software.

These workers supervise the building and testing of prototypes according to general instructions and established standards, and they conduct or supervise the installation, commissioning and operation of electrical and electronic equipment and systems other than aircraft electronics or instruments. They carry out applied research in fields of electrical and electronic engineering and physics under the direction of scientists or engineers, as well as set up and operate specialized and standard test equipment to diagnose, test and analyse the performance of electrical and electronic components, assemblies and systems.

They also write specifications, schedules and technical reports, as well as control schedules and budgets. They assist in the design, development and testing of electrical and electronic components, equipment and systems. Further, they assist in inspection, testing, adjusting and evaluation of incoming electrical, electro-mechanical and electronic components and assemblies to ensure conformance with product specifications and tolerances. In addition, they conduct life tests (burn-ins) on assemblies and then record and analyse results.

They also assist in building and testing prototypes to specifications, carry out a limited range of technical functions in support of research in electrical and electronic engineering and physics and install, operate and maintain electrical and electronic equipment and systems. They calibrate electrical or electronic equipment and instruments according to technical manuals and written instructions. They collect and compile operational or experimental data, and they assist in the preparation of estimates, schedules, budgets, specifications and reports.

Example Titles

- apprentice electronics technician
- production support technician, electronics
- distribution design technologist, lines
- electronics design technologist
- communications technologist
- electronics technologist, physics department
- lighting technologist
- metering technologist
- microwave maintenance technician
- electronics manufacturing technician or technologist
- electrical engineering technician or technologist
- electronics engineering technician or technologist

Education and Training

Electrical and *electronics engineering technicians* and *technologists* generally require completion of a relevant two-year college program, such as electrical or electronics engineering technology, computer engineering technology or telecommunications technology. Certification through the Applied Science Technologists and Technicians of B.C. may be required for some positions and requires a two-year period of supervised work experience following training.

Two-year diplomas in electronics engineering are available at Okanagan University College, Kwantlen University College, North Island College and College of New Caledonia. The University College of the Cariboo offers three electronics technician programs that focus on computer and telecommunications systems. Electronics technician certificate programs are offered by Vancouver Community College and Selkirk College. Entry-level and apprenticeship certificate options are also available at Selkirk.

Camosun College also offers two-year technology programs in computer engineering and electronics engineering, as well as electronics technician programs with specializations in electrical and control systems. Graduates who complete a six-month bridge program at Camosun College may transfer directly into the third year of a Computer Engineering or Electrical Engineering bachelor's degree program at the University of Victoria.

The British Columbia Institute of Technology (BCIT) offers a variety of programs for people interested in working in this field. BCIT offers several two-year diploma options in Electronic Engineering Technology. Program options include automation and instrumentation, computer control, electrical power or telecommunications. A Bachelor of Technology in Electronics is also available at BCIT.

Some colleges and university colleges in B.C. offer technology access programs to allow students to upgrade prior to entering a technology program.

Engineering technicians and technologists require an aptitude for mathematics and an eye for detail. They must be able to work well with others, since they are often part of a team, but as well be able to work independently and take initiative when necessary. Good communication and analytical skills, adaptability, flexibility and comfort with computers are necessary. For some work in this field, defective colour vision may limit employment opportunities. Ongoing education is important, and management skills may be helpful.

©Stone/Vancouver

Working Conditions

Electrical and *electronics engineering technologists* and *technicians* usually work regular hours in laboratories, offices and electronics and industrial plants. Some may be exposed to hazards from equipment and electrical shocks, but the work is usually interesting and challenging and provides an ongoing learning environment.

In 1995 the average annual earnings for all workers in these occupations were $38,300. Those who were employed full time for the whole year account for 67% the workers, and they earned an average of $46,000. The respective all-occupation averages in the province in 1995 were $27,900 and $39,400. The number of employed workers rose 83%, from 2,140 in 1990 to 3,920 in 1998. According to a survey of recent college graduates, those who found work as electrical and electronics engineering technologists and technicians earned an average of $2,420 per month ($29,000 per year).

Only 6% of the workers are currently self-employed (compared to an all-occupation average of 15%), and 6% are employed part time (compared to 26% for all occupations). Increased competition has caused many companies to restructure, resulting in a drop in permanent positions and a rise in self-employment and contract work. This trend is expected to continue and may contribute to the relatively high level of part-year work. About 28% of the electrical and electronics engineering technologists and technicians are employed full time, part year (compared to 27% for the workforce as a whole). The unemployment rate is lower than the average for all occupations.

These workers are found in a variety of industries, but the largest concentrations are employed in electric and electronic products (19%), professional business services (14%) and electric power (11%). Other important industries for these workers include wholesale trade, telecommunication carriers and the federal government.

About two-thirds (67%) of the workers in this group are located in the Lower Mainland, compared to 57% for the all-occupation B.C. average. Vancouver Island is home to 17%, the Okanagan/Kootenay region is the base for 8%, and 7% work in Northern B.C.

Women account for only 7% of these workers. The age distribution for workers in this occupation is close to the average for all occupations. The average age is 39.

Employment Prospects

This is a large occupational group, made up of about 3,920 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment in this group to grow at an annual rate of 1.7%, about as fast as the average for all occupations. According to this projection, 1,050 positions will become available from 1998 to 2008. Over two-thirds of these positions will result from growth in the number of new positions, and the remainder will result from the replacement of workers who retire.

According to industry sources, B.C.'s growing and globally competitive electronics industry is the main source of employment growth for *electrical* and *electronic engineering technologists*. The electronics industry is evolving rapidly, and employment opportunities are opening up in design, testing and maintenance work in electrical components, computers, telecommunications equipment and scientific research instruments, as well as in audiovisual and electronic equipment manufacturing companies.

According to industry sources, the growing demand for electrical and electronic engineering technologists has meant that there are more job openings than new graduates. This makes it easier for qualified graduates to penetrate the job market.

Those who are skilled in the design of machines and robots for computerized production and in quality control will have an advantage over others in competing for employment opportunities. It is also very useful for workers in this field to keep abreast of developments within their area of expertise because they often need to repair increasingly complex equipment.

Additional Information

Applied Science Technologists and Technicians of B.C.
http://www.asttbc.org

For more information on computer-related occupations, see the *Information Technology Occupations* section in the *Introduction to Work Futures*.

Related Occupations

- electronic service technicians (household and business equipment) (2242)
- industrial instrument technicians and mechanics (2243)
- aircraft instrument, electrical and avionics mechanics, technicians and inspectors (2244)
- technical sales specialists, wholesale trade (6221)

Electronic Service Technicians (Household and Business Equipment)

NOC 2242

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	5,390	8,760	10,360

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
1,600	730	2,330

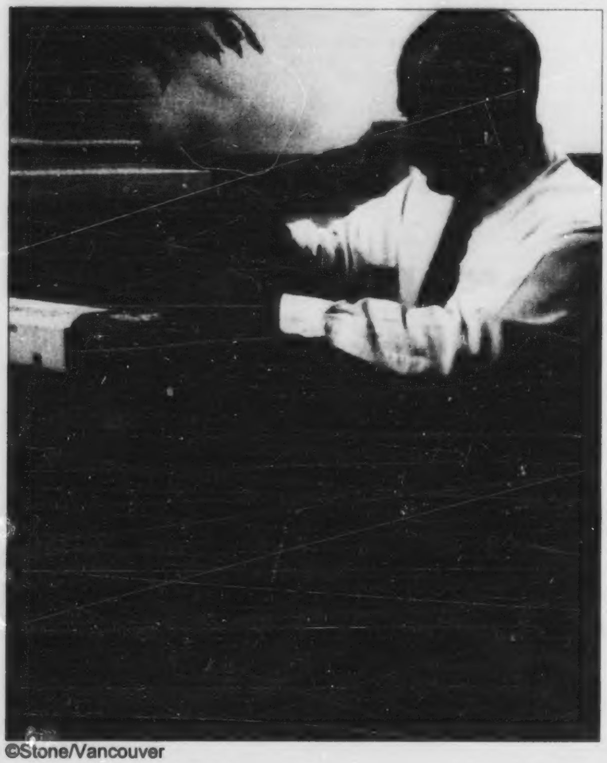
Annual Growth 1998-2008	1.7%
Main Industries of Employment	
Other Business Services	26%
Wholesale Trade	25%
Retail Trade	12%
Employment by Region	
Lower Mainland	68%
Vancouver Island	16%
Northern B.C.	5%
Okanagan/Kootenay	12%
Self-employment	17%

Nature of the Work

Electronic service technicians service and repair household and business electronic equipment, such as audio and video systems, computers and peripherals, office equipment and other consumer electronic equipment and assemblies. They are employed by electronic service establishments and retail and wholesale distributors, and within service departments of electronic manufacturing companies.

Main Duties

Electronic service technicians install, maintain and repair household and business electronic equipment, such as televisions, radios, video cassette recorders, stereo equipment, photocopiers, computers and peripherals. They inspect and test electronic equipment, components and assemblies using multimeters, circuit testers, oscilloscopes, logic probes and other electronic test instruments, tools and equipment. Further, they diagnose and locate circuit, component and equipment faults, and they adjust, align, replace or repair electronic equipment, assemblies and components following equipment manuals and using soldering tools and other hand and power tools. They also complete work orders, test reports and maintenance reports, and they may supervise other electronic equipment service technicians.



©Stone/Vancouver

Example Titles

- apprentice office machine repairer
- office equipment service technician
- computer service technician
- television servicer
- photocopy machine technician
- apprentice security alarm installer
- alarm system technician
- audio-video service technician
- apprentice electronics technician, consumer products
- electronic service technician supervisor
- field service technician, electronic products

Education and Training

Electronic service technicians may find work that involves on-the-job training following completion of high school and a college course in electronics, but completion of two or three years of college or an apprenticeship is typical.

There are a few relevant apprenticeships.

Electronic Technician apprentices usually require grade 12 or equivalent, with English 12, and mathematics and physics 11. The term of this apprenticeship is four years and includes four periods of in-school training. Completion of an approved entry-level training program may confer credit towards technical training. Upon successful completion of on-the-job training and in-school training, apprentices are issued a Certificate of Apprenticeship.

Domestic Radio and Television Servicing Technician apprentices complete a four-year apprenticeship. They are advised to complete the same prerequisite education as Electronic Technician apprentices.

Electronic technician and domestic radio and television servicing technician apprentices require completion of a provincial common core in electronics before starting an apprenticeship. This common core is offered at the British Columbia Institute of Technology (BCIT), Camosun College, College of New Caledonia, North Island College, Selkirk College, University College of the Cariboo and Vancouver Community College. Upon completion of the apprenticeship, apprentices are issued a Certificate of Apprenticeship.

People who have worked full time in the domestic radio and television servicing trade for a minimum of six years but have not apprenticed may be eligible to write an examination and be issued a Certificate of Qualification. Local apprenticeship offices can provide more details.

A four-year Office Machine Mechanic apprenticeship is also available. Recommended education prior to entering this apprenticeship is grade 10 or equivalent, including English, mathematics and science, but grade 12 is preferred. Upon completion, apprentices receive a Certificate of Apprenticeship.

For those interested in an apprenticeship for alarm security, see the profile Other Installers, Repairers and Servicers (744) for details.

Public post secondary institutions offer a variety of relevant programs in this area. North Island College offers two programs. These are a certificate program in Electronics Technology that can be completed in 10 months and a 10-month program that offers entry-level training in electrical and industrial electronics. Courses in the certificate program are transferable to other institutions should the student continue with training. The electrical and industrial electronics program is designed to train students for employment as an apprentice or tradesperson helper.

A two-year program in electronics technology is available at Kwantlen University College. Graduates may find employment or transfer into university degree programs. University College of the Cariboo offers three two-year diploma programs. These are Computer Automated Systems Technician, Computer Systems Technician and Telecommunications Technician. Camosun College has a one-year program for electronics technicians, which prepares graduates for employment or continued education.

Vancouver Community College has several programs for students who wish to complete the electronics common core requirements. A basic 8-month program is offered, as well as a 12-month program for those whose first language is not English and other programs for those who cannot attend regularly-scheduled classes or who cannot attend full time. An additional six months of training allows students to specialize in the fields of computers, telecommunications and consumer equipment. Completion of the common core requirements and two specializations makes students eligible for a diploma.

BCIT also offers the common core program. A certificate is awarded after one year of study, and specialization in avionics, business equipment, electrical control service, industrial instrumentation or telecommunications is possible at that point. A certificate in electricity and industrial electronics is available after one year of study.

Some colleges and university colleges in B.C. offer technology access programs to allow students to upgrade prior to entering a technology program.

Workers in this field require an eye for detail. They must be able to work independently. Good communication and analytical skills, adaptability and flexibility are necessary. For some work in this field, defective colour vision may limit employment opportunities. Ongoing education may be necessary.

Working Conditions

Electronic service technicians can work in offices, service shops, stores, apartment buildings and private houses. They work mainly indoors, but may have to travel to provide on-site service. They must have a flexible attitude about working hours because customers are demanding more service in this respect.

In 1995 the average annual earnings for electronic service technicians were $28,200, which is very close to the all-occupation average of $27,900. However, those who worked full time for the whole year earned an average of $35,200, or 11% less than the provincial average of $39,400. According to a survey of recent college graduates, new entrants to these occupations earned an average of $2,280 per month ($27,600 per year).

This is a large occupational group. The number of employed workers rose by 63%, from 5,390 in 1990 to 8,760 in 1998. About 17% of this group are self-employed (compared to 15% for the B.C. all-occupation average), and 12% work on a part-time basis (compared to 26% for the B.C. all-occupation average). Unemployment is lower than the average for all occupations, and there is no seasonal variation in the workload associated with these occupations.

Workers in this group are found in a wide range of industries, with the largest concentrations employed in business services (26%), wholesale trade (25%) and retail trade (12%). The majority of these workers (68%) are located in the Lower Mainland. As for the rest of the workers, 16% are on Vancouver Island, 12% are in the Okanagan/Kootenay region, and 5% are in Northern B.C.

This is an occupation dominated by men, with women accounting for only 8% of the workers. The proportion of these workers in the 25 to 34 age group (35%) and the 35 to 44 age group (32%) is higher than the all-occupation average. The concentration of workers in this age range suggests that many workers have entered this field fairly recently but that training and experience are still important factors for these occupations. The average age is 37.

Employment Prospects

This is a large occupational group, made up of about 8,760 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment in this group to grow at an annual rate of 1.7%, about as fast as the average for all occupations. According to this projection, 2,330 positions will become available from 1998 to 2008. Over two-thirds of these openings will result from growth in the number of new positions, and the remainder will come from the need to replace workers who retire.

Increasing globalization and the continued trend towards computerization and other forms of electronic automation are the main sources of employment growth for *electronic service technicians*. Organizations are becoming increasingly dependent on the efficiency of their computer systems and other electronics in order to remain competitive in the global economy. This is expected to spark a rise in the use of serviceable business and industrial machines with electronic components. The proliferation of new household appliances using electronic components will also be a source of employment growth for these workers because these appliances will also need servicing. The growing use of audio-digital tape readers as well as digital and high-definition televisions will be a source of employment growth as well for these workers.

Some other factors will act to restrict employment growth for these workers. For example, ongoing developments in appliances, greater quality control and improved manufacturing techniques will continue to increase the reliability of electronic equipment and appliances. This increased reliability will reduce the average number of repairs for each appliance and piece of equipment. Improved diagnosis and repair capabilities will also reduce the number of work hours per repair. The price of some electronic appliances has dropped over the years, making it more likely for consumers to choose to replace broken devices rather than have them repaired. However, the net employment impact of these factors is not clear. Declining prices and increasing reliability may also lead to an increasing use of repairable electronic appliances both at home and in business.

According to industry sources, there is currently a shortage of qualified electronic service technicians. This will make it easier for qualified graduates to penetrate the job market.

Sustained competitiveness in a knowledge-based global economy requires vigorous and ongoing commitment to scientific and technological innovation. For this reason, it is particularly useful for workers in this field to keep abreast of developments within their area of expertise. Periods of retraining and professional development are common for these workers. Those who have updated skills and knowledge have a large advantage over others in competing for employment opportunities in this field.

Additional Information

Industry Training and Apprenticeship Commission
http://www.itac.gov.bc.ca

For more information on computer-related occupations, see the *Information Technology Occupations* section in the *Introduction to Work Futures*.

Related Occupations

- electrical and electronics engineering technologists and technicians (2241)

Industrial Instrument Technicians and Mechanics

NOC 2243

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	500	1,000	1,220

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
220	80	300

Annual Growth 1998-2008 2.0%

Main Industries of Employment

Pulp and Paper Manufacturing	37%
Gas Distribution Utilities	15%
Wholesale Trade	10%

Employment by Region

Lower Mainland	36%
Vancouver Island	25%
Northern B.C.	23%
Okanagan/Kootenay	15%

Self-employment 3%

Nature of the Work

Industrial instrument technicians and *mechanics* repair, maintain, calibrate, adjust and install industrial measuring and controlling instrumentation. They are employed by pulp and paper processing companies, by hydro power generating companies, by mining, petrochemical and natural gas companies, by industrial instrument and other manufacturing companies, and by industrial instrument servicing establishments. Industrial instrument mechanic apprentices are included in this unit group.

Main Duties

Industrial instrument technicians and *mechanics* consult manufacturers' manuals to select tests and maintenance procedures for instruments that are used for measuring and controlling variables in manufacturing and processing. Example variables include flow, level, pressure and temperature.

Workers in these occupations also diagnose faults by inspecting and testing the operation of instruments and systems. Additional duties include repairing and adjusting system components. Defective parts may also be removed or replaced.

Industrial instrument technicians and mechanics also calibrate components and instruments according to manufacturers' specifications.

Workers in this group perform scheduled preventive maintenance work, complete test and maintenance reports, troubleshoot and tune industrial processes.

These workers also install, configure, troubleshoot and tune process control computers.

Example Titles

- industrial instrument mechanic
- industrial instrumentation technician
- apprentice industrial instrument mechanic

Education and Training

Persons in this field usually complete a five-year apprenticeship program in industrial instrument mechanics. Recommended education for apprentices is grade 12 or equivalent, including English 12 and mathematics and physics 11. The apprenticeship involves five 8-week periods of in-class technical training at the British Columbia Institute of Technology (BCIT) in Burnaby. Completion of an entry-level training program may confer credit towards some of the required technical training. Upon completion of the apprenticeship, an apprentice must pass an interprovincial standards examination to receive a Certificate of Qualification with an interprovincial Red Seal endorsement.

For people who have worked for a long time in this trade but have never completed an apprenticeship a Certificate of Qualification is available. The certificate is awarded following submission of evidence of 7.5 years' full time experience as an industrial instrument mechanic, plus successful completion of an exam. Current details regarding this apprenticeship can be obtained by contacting a local Industry Training and Apprenticeship Commission area office.

There are courses available for those who do not necessarily wish to pursue apprenticeship training. North Island College offers a 36-week electronics technician program with an industrial electronics specialty. BCIT students can take a 40-week Industrial Instrumentation Service Technician Diploma program. Prerequisites for both of these programs include completion of a provincially approved Electronics Common Core Program that is offered at many provincial colleges, university colleges and BCIT. As well, a certificate in Electricity and Industrial Electronics is available after 40 weeks of study. Prerequisites include grade 12, with English and math 11.

Industrial instrument technicians and mechanics must have good hand-eye coordination, mechanical aptitude and computer skills. Management skills may be an asset. Ongoing education in electronics and computer use is necessary in order to be successful. For some work in this field, defective colour vision may limit employment opportunities.

Working Conditions

This is a very well paid occupational group. The average annual earnings for all B.C. workers in these occupations were $51,700 in 1995, with the 76% who worked full time for the full year earning $55,900 on average. The respective all-occupation averages in the province in 1995 were $27,900 and $39,400.

According to a survey of recent college graduates, new entrants to these occupations reported earning an average of $2,870 per month ($34,500 per year).

This is a small occupational group. There were 500 workers employed as *industrial instrument technicians* and *mechanics* in 1990, but this number doubled to 1,000 by 1998. Most of the workers (76%) are employed full time, all year round. Another 22% work full time for part of the year. But part-time work is almost nonexistent (only 1% work part time). The unemployment rate is lower than the average for all occupations. Seasonal work is not common in this group.

Only 3% of industrial instrument technicians and mechanics are self-employed, a proportion much lower than the overall provincial average of 15%. However, industry observers believe that self-employment and contractual or temporary work will increase for this occupational group.

Industrial instrument technicians and mechanics are mainly employed in the pulp and paper industry (37%), mining, crude petroleum and natural gas (19%), wholesale trade (10%) and electric power utilities (7%). This occupational group is distributed throughout the province more evenly than most occupations. The distribution of workers tends to favour the less urban areas, which reflects the location of pulp and paper and other heavy industrial industries that employ these workers. About 36% of the workers are located in the Lower Mainland, 25% on Vancouver Island, 23% in Northern B.C. and 15% in the Okanagan/Kootenay region.

There are virtually no women (1%) working in these occupations. The majority (64%) of workers are between the ages of 35 and 54, a higher proportion in this age range than for the workforce as a whole (49%). There are also very few (2%) workers in the 15 to 24 age group. This age distribution reflects the need for apprenticeship and the value placed on experience in these occupations. The average age is 42.

Employment Prospects

This is a small occupational group, made up of only about 1,000 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment in this group to grow at an annual rate of 2.0%, faster than the average for all occupations. According to this projection, only 300 positions will become available from 1998 to 2008. Almost three-quarters of these openings will result from growth in the number of new positions, and the remainder will come from the need to replace workers who retire.

This high employment growth forecast for *industrial instrument technicians* and *mechanics* is largely a result of the growing use of technologies in industries such as manufacturing, including pulp and paper manufacturing, and petrochemical related industries. Globalization and technology are interacting in a way that forces many firms to automate existing industrial processes in order to remain competitive. Since industrial instruments are often the foundation of automation processes, the demand for the services of these professionals will grow. Many additional openings could be created through more pollution control activities that make wide use of industrial instruments.

Competitiveness in our knowledge-based global economy is causing advancements in technology to take place at an astonishingly rapid rate. For this reason, it is useful for workers in this field to keep abreast of developments within their area of expertise. Industrial instrument technicians must have knowledge of pneumatics, electropneumatics, hydraulics, electricity and electronics. Periods of retraining and professional development are common for these workers. Those who have updated skills and knowledge have an advantage over others in competing for employment opportunities in this field.

Candidates who pay attention to detail, have manual dexterity and like to understand and solve problems will have an advantage over others in the job market. Patience, self-control and the ability to work on a team are also desirable qualities. Employees in this field must sometimes work in shifts.

Red Seal trade certification allows for interprovincial mobility. Advancement to supervisory positions is possible with experience.

Recruitment is usually done in-house. If there are no suitable candidates already employed in the company, then the second choice method is newspaper ads.

Related Occupations

- electrical and electronics engineering technologists and technicians (2241)
- aircraft instrument technicians (in 2244 aircraft instrument, electrical and avionics mechanics, technicians and inspectors)
- industrial mechanics (in 731 machinery and transportation equipment mechanics)

Globalization and technology are interacting in a way that forces many firms to automate existing industrial processes in order to remain competitive.

Aircraft Instrument, Electrical and Avionics Mechanics, Technicians and Inspectors

NOC 2244

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	490	550	680

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
130	50	180

Annual Growth 1998-2008	2.1%
Main Industries of Employment	
Air Transportation	58%
Aircraft and Parts Manufacturing	18%
Federal Administration	15%
Employment by Region	
Lower Mainland	68%
Vancouver Island	18%
Northern B.C.	7%
Okanagan/Kootenay	8%
Self-employment	2%

Nature of the Work

This occupational group includes mechanics and technicians who maintain aircraft instrument, electrical or avionics systems. This group also includes avionics inspectors who inspect instrument, electrical and avionics systems after maintenance is complete. Workers in these occupations are employed by aircraft manufacturing, maintenance and overhaul establishments and by airlines, the armed forces and other aircraft operators.

Main Duties

Aircraft instrument mechanics and *technicians* maintain aircraft instruments.

Aircraft electrical mechanics and *technicians* maintain aircraft electrical systems and equipment.

Avionics mechanics and *technicians* maintain aircraft electronic systems and equipment, including communications and navigation equipment.

Avionics inspectors inspect and test aircraft instrument, electrical and avionics systems, and they certify that maintenance of these systems meets Transport Canada and company standards of performance and safety.

Example Titles

- aircraft electrical technician
- avionics technician
- instrument inspector, aircraft
- avionics inspector
- aircraft instrument mechanic
- aircraft electrician
- aircraft maintenance engineer, avionics
- electronics inspector, missiles
- instrument overhaul and repair mechanic

©Stone/Vancouver

Education and Training

Aircraft instrument and *avionics mechanics* and *technicians* generally require completion of a two-year college program in avionics or electronics or completion of a four-year apprenticeship. Aircraft electrical mechanics and technicians generally require completion of a college program as an electrical or electronics technician. Several years of on-the-job training usually follow. Those who sign maintenance releases require an Aircraft Maintenance Engineer (AME) licence. This licence is granted after passing Transport Canada exams and may be endorsed for inspection of aircraft and avionics systems at different levels. Avionics inspectors require three to five years' experience as avionics mechanics or technicians, plus an AME licence with endorsements for avionics systems.

Aircraft Maintenance Technicians apprentice for four years. Recommended education for apprentices is grade 12, including English 12, algebra or trade mathematics 11, and physics or science and technology 11. Upon completion of the apprenticeship, apprentices receive a Certificate of Apprenticeship.

The British Columbia Institute of Technology (BCIT) offers an electronics technician common core program. A certificate is awarded after one year of study, after which students can go on to pursue either an aircraft electronics technician (avionics) or aircraft maintenance engineering diploma. BCIT also offers several certificate options for students interested in pursuing a career in this field. A certificate in electricity and industrial electronics is also available at BCIT after one year of study.

Northern Lights College offers an electronic technician common core program and an Aircraft Maintenance Engineering Program, which grants graduates a diploma as well as 18 months of experience toward the 48-month experience requirement for an Aircraft Maintenance Engineer's licence.

Vancouver Community College has several programs for students who wish to complete an electronics "common core" program. A basic 8-month program is offered, as well as a 12-month program for those whose first language is not English and other programs for those who cannot attend regularly-scheduled classes or who cannot attend full time. Additional training is necessary in order to specialize. The College of New Caledonia also offers a common core program in electronics.

North Island College offers a 10-month certificate program in electronics technology and a 10-month program in electrical and industrial electronics. Courses in the certificate program are transferable to other institutions should the student continue with training, whereas the electrical and industrial electronics program is designed to train students for employment as an apprentice or tradesperson helper.

A two-year program in electronics technology is available at Kwantlen University College. Graduates may find employment or transfer into university degree programs. Camosun College has a one-year program for electronics technicians, which prepares graduates for employment or continued education.

Some colleges and university colleges in B.C. offer technology access programs to allow students to upgrade prior to entrance into a technology program.

For some work in this field, defective colour vision may limit employment opportunities.

Aircraft instrument and avionics mechanics and technicians must have good hand-eye coordination, mechanical aptitude and computer skills. Management skills may be an asset. Ongoing education in electronics and computer use is necessary in order to be successful.

Working Conditions

Mechanics, technicians and *inspectors* usually work in hangars or in other indoor areas, although they may work outdoors, sometimes in unpleasant weather, when the hangars are full or when repairs must be made quickly. These workers often work under time pressure to maintain flight schedules or, in general aviation, to keep from inconveniencing customers. At the same time mechanics must maintain safety standards, and this can cause the job to be stressful.

Frequently, mechanics must lift or pull as much as 50 pounds. They often stand, lie or kneel in awkward positions and occasionally must work in precarious positions on scaffolds or ladders. Noise and vibration are common when testing engines. Aircraft mechanics generally work 40 hours a week on 8-hour shifts around the clock.

The average earnings for all B.C. workers in these occupations were $45,000 in 1995, with the 79% who worked full time for the full year earning $47,200. These figures are above the provincial averages of $27,900 and $39,400 respectively. According to a survey of recent college graduates, new entrants to these occupations earned an average of $2,630 per month ($31,600 per year).

The number of workers in this very small occupational group increased by 12% between 1990 and 1998, with approximately 550 employed in 1998. The majority work at full-time positions (96%). Part-time work is almost nonexistent, at only 3%. Unemployment is also lower than the average for all occupations.

Only 2% of the workers in this group are self-employed, much lower than the overall provincial average of 15%. Workers are mainly employed in the air transport industry (58%), in the aircraft and parts industry (18%) and in federal administration (15%). Most workers live in the Lower Mainland (68%), which is the location of Vancouver International Airport. As for the balance of the workers, 18% are on Vancouver Island, 8% are in the Okanagan/Kootenay region, and 7% are in Northern B.C.

There are virtually no women working in these occupations (3%). Workers in this group tend to be older. The average age of workers in this group is 43 years of age, five years above the provincial all-occupation average. Compared to the B.C. average for all workers, this occupational group has few people in the 15 to 24 age group (only 4% compared to 15% for the total workforce) and a high proportion of people in the 55 to 64 age group (20% compared to 9% for the total workforce).

Employment Prospects

This is a very small occupational group, made up of only about 550 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment in this group to grow at an annual rate of 2.1%, faster than the average for all occupations. According to this projection, only 180 positions will become available from 1998 to 2008. Almost three-quarters of these openings are projected to result from growth in the number of new positions, and the remainder will come from the need to replace workers who retire.

A major source of uncertainty with this forecast is the restructuring currently underway in the airline industry. Air Canada recently took over ownership of Canadian Airlines, and the effects of this are not yet clear. Although Air Canada has announced that there will be no involuntary layoffs, some industry analysts predict that the number of workers currently working for the two airlines will decline by 10%. There is disagreement about the effects that this merger will have on the amount of Canadian air traffic and the number of aircraft in use. These factors determine how many and how often aircraft must be inspected and maintained, which is directly linked to the employment of these professionals. Some industry analysts suggest that the reduction in competition will push air ticket prices up and, consequently, reduce the overall amount of air traffic. Other sources suggest that the merger will reduce the destructive components of domestic competition among airlines and, in this way, increase the overall efficiency of the airline industry. Some of these savings may be passed on to consumers in the form of lower ticket prices, which may ultimately increase the amount of Canadian air traffic.

One source of employment growth in the air transportation industry is the increased business and personal air traffic from Asia resulting from growth in those economies. Vancouver is a key air transport centre, particularly for Canadian and Northwestern U.S. connections to Asia.

The replacement of aging aircraft may restrict employment growth for these workers. Canadian Airlines Corporation intends to spend billions to replace 60 to 70 of its aircraft over the following five years. Replacing older aircraft by newer ones reduces the amount of repairs and routine maintenance necessary. It may also change the nature of the repairs and routine maintenance, requiring some retraining and upgrading of skills.

Given the difficulty involved in accurately predicting the future of the airline industry, individuals considering these occupations are advised to obtain up-to-date information from employers before making training decisions.

Advancement to supervisory positions within specific areas of expertise is possible with experience.

Avionics inspectors may also obtain further endorsements to their Aircraft Maintenance Engineer licence. These additional endorsements allow them to inspect and certify a broader range of aircraft and avionics systems.

Computers are often used in diagnosis, requiring all workers in these occupations to have adequate computer skills.

Additional Information
Canadian Aviation Maintenance Council
http://www.camc.ca/

Related Occupations

- mechanical, electrical and electronics assemblers (948)
- aircraft mechanics and maintenance engineers who maintain and inspect aircraft structures, mechanical, hydraulic or propulsion systems (in 731 machinery and transportation equipment mechanics)
- government airworthiness inspectors (in 226 other technical inspectors and regulatory officers)

> ***One source of employment growth in the air transportation industry is the increased business and personal air traffic from Asia resulting from growth in those economies. Vancouver is a key air transport centre, particularly for Canadian and Northwestern U.S. connections to Asia.***

Technical Occupations in Architecture, Drafting, Surveying and Mapping

NOC 225

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	7,180	6,550	7,280

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
730	680	1,410

Annual Growth 1998-2008 1.1%

Main Industries of Employment

Professional Business Services	48%
Local and Other Administration	6%
Metal Fabrication Manufacturing	6%

Employment by Region

Lower Mainland	63%
Vancouver Island	16%
Northern B.C.	10%
Okanagan/Kootenay	10%

Self-employment 17%

Nature of the Work
People in this occupational group work in government, architectural and construction companies, utility, resource and manufacturing industries, private sector design, surveying, mapping and computer software firms and other organizations.

Main Duties
Architectural technologists and *technicians* research and prepare drawings and contracts for professional architects and civil design engineers.

Industrial designers create and produce designs for consumer, industrial and business products.

Drafting technologists and *technicians* use computer-aided design and drafting and other drafting equipment to prepare designs and drawings.

Survey technologists and *technicians* conduct or participate in field surveys to determine exact locations and positions of natural features and other structures.

Mapping and *related technologists* and *technicians* prepare maps, interpret aerial photographs and operate airborne remote and in-house sensing and interpretive equipment, as well as geographic information systems.

Example Titles

- architectural technologists and technicians
- industrial designers
- drafting technologists and technicians
- survey technologists and technicians
- mapping and related technologists and technicians

Education and Training

Those who wish to become drafting technicians require grade 12, then completion of a one- to two-year college program or four- to five-years' work experience while taking college or industry courses in drafting. Completion of a relevant college program is necessary in order to work as a *survey* or *mapping technician*, as an *architectural, drafting* and *design, survey*, or *mapping technologist*, or as an *industrial designer*.

Relevant programs for mapping technicians and technologists, following completion of secondary school, can be combinations of study involving cartography, photogrammetry, aerial surveying, remote sensing and geographic information systems. A university degree in industrial design, architecture or engineering may be required for some industrial design positions. Evidence of creative ability, as demonstrated by a portfolio of work, also usually is necessary in order to find work as an industrial designer.

Certification through a provincial or national association may be required for some positions in this field and generally requires a two-year period of supervised work experience following formal training. In some cases certification may be available but not mandatory.

Individual courses of study in these fields of work are available at many B.C. institutions. Some training may be available at private training institutions.

Ten-month certificate programs in architectural drafting and design are available at Kwantlen University College, University College of the Fraser Valley, the British Columbia Institute of Technology (BCIT) and Vancouver Community College (VCC). A nine-month Drafting Certificate is available at North Island College. Students in these programs learn basic design and computer aided design and drafting (CADD) then pursue specializations in areas such as industrial, structural or mechanical drafting. At VCC, an additional six months of training beyond the certificate level earns a diploma. The College of New Caledonia (CNC) offers a one-year certificate or a two-year diploma in Engineering Graphics and Design Technology. A three-year Bachelor of Design with an industrial design major is available at the Emily Carr Institute of Art and Design.

BCIT also offers a two-year Building Technology Engineering Diploma with an architectural major. Applicants with good grades and work experience may have an advantage. BCIT has a one-year CADD program for those who have completed a diploma in engineering, as well as a one-year technician program and a two-year diploma program in geomatics. Geomatics diploma graduates can go on to pursue a Bachelor of Technology in Geomatics from BCIT as well. University College of the Cariboo offers a two-year Engineering Design and Drafting Technology program. For students who are interested in mapping and surveying, BCIT and CNC both offer one-year programs in Geographic Information Systems.

Those who wish to be successful in this field must be comfortable with mathematics, computers and electronic equipment and able to work under pressure. They must be creative and able to visualize space relationships in three dimensions, as well as have concern for details and accuracy. They need to be patient and organized, with good problem-solving skills. They must be able to work well with others and have good communication skills. An interest in geography is helpful for those entering the mapping technology field.

See the profiles Civil, Mechanical, Electrical and Chemical Engineers (213), Other Engineers (214), and Architects, Urban Planners, and Land Surveyors (215) for details on obtaining university degrees in these fields.

Working Conditions

Architectural technologists and *technicians, industrial designers, drafting technologists* and *technicians* and *mapping technologists* and *technicians* all work indoors. *Survey technologists* and *technicians* are based out of offices and spend considerable time taking measurements at various outdoor sites.

People in this occupational group typically work regular hours. However, they may work longer hours on occasion to meet project deadlines or to take advantage of favourable weather conditions. Considerable time is spent working with computers. *Architectural, industrial* and *drafting technologists* and *technicians* use computer aided design software in their work. *Survey* and *mapping technologists* and *technicians* use computers to perform computations and map drafting.

The 1995 average annual earnings for all B.C. workers in this occupational group were $31,600. About 59% of the workers in this group worked full time for the whole year and earned an average of $39,500. There was not much variation in average full-time, full-year earnings among the occupations in this group. Architectural technologists and technicians earned the most at $40,100, and survey technologists and technicians earned the least at $37,600. By comparison, the all-occupation averages in the province in 1995 were $27,900 (average annual earnings) and $39,400 (average full-time, full-year earnings). According to a survey of recent college graduates within this group, new entrants to the occupation of survey technologists and technicians earned the most, with an average of $2,730 per month ($32,800 per year), and new entrants to the occupation of drafting technologists and technicians earned the least, with an average of $2,340 per month ($28,100).

The number of workers in this occupational group decreased by 9% between 1990 and 1998, with approximately 6,550 workers employed in 1998. Drafting technologists and technicians accounted for almost 89% of the decrease. The proportion of part-time workers is very low at only 9% (compared to the all-occupation average of 26%). The level of self-employment varies considerably among the occupations. Those workers who are self-employed represent 37% of the industrial designers, 28% of the architectural technologists and technicians, 17% of the drafting technologists and technicians, and just 8% each of the survey and mapping technologists and technicians. For the most part, unemployment is lower than the average for all occupations. However, the unemployment rate for survey technologists and technicians is about the same as the average for all occupations.

Of the individual occupations within this group, drafting technologists and technicians is by far the largest (61%). As for the rest of the people employed in these occupations, 9% are architectural technologists and technicians, 9% are survey technologists and technicians, 9% are industrial designers, and 12% are mapping and related technologists and technicians.

Workers in this occupational group are mainly employed in professional and other business services (52%), provincial and local government (9%), metal fabrication manufacturing (6%) and construction (4%). Most of these workers are located in the Lower Mainland (63%) and on Vancouver Island (16%). The Okanagan/Kootenay region is somewhat underrepresented at 10%, compared to 15% for the all-occupation average. The final 10% of these workers are located in Northern B.C.

Women make up only 20% of workers in these occupations, well below the workforce average of 46%. The age distribution is reasonably close to that of the all-occupation average. The average age of all workers in this occupational group is the same as the provincial average, at 38.

Employment Prospects

This is a large occupational group, made up of about 6,550 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment in this group to grow at an annual rate of 1.1%, slower than the average for all occupations. According to this projection, 1,410 positions will become available from 1998 to 2008. A little over half of these openings will come from growth in the number of new positions, and the remainder will come from the need to replace workers who retire.

Almost half of this group works in professional business services, which is where most employment growth is expected to occur. A strong contribution to employment growth is also expected from electrical and electronic products manufacturing. Openings will also result from expansion in the research, development and production of technical products.

Drafting technologists and *technicians* make up the largest occupation in this group. Employment in this occupation is projected to grow more slowly than the all-occupation average. However, as it is the largest occupation in this group, almost 60% (820 in total) of the total projected openings are for positions in this field. Employment of *mapping* and *related technologists* and *technicians* is projected to grow faster than the all-occupation average and faster than any other occupation in this group. A total of 250 openings are projected to become available for these workers. Employment of *industrial designers* is projected to grow about as fast as the average rate for all occupations, amounting to a total of 180 openings over the projection period. Employment of both *architectural technologists* and *technicians*, and *survey technologists* and *technicians* is projected to grow more slowly than the average for all occupations. Less than 100 openings are projected to become available for each of these occupations (170 in total).

Industry sources agree that employment growth for drafting technologists and technicians will be slow. Industrial growth and increasingly complex design problems associated with new products and manufacturing have resulted in a growing demand for drafting services. However, the growing use and capabilities of computer aided design (CAD) technologies have increased the productivity of drafters. According to industry sources, most drafters in B.C. today are CAD operators. Consequently progressively fewer but more highly skilled technologists and technicians will be required to complete the same amount of drafting. CAD/CAM is no longer a field involving specialized skills. Some software programs have become essential working tools and common to specialists, such as architects, landscape architects, designers, surveyors, civil engineering technicians and construction technicians, as well as to those providing drafting technical support. Those who have skill and experience using CAD systems will have an advantage over others in competing for employment opportunities.

Industry sources disagree with the faster than average employment growth forecast for mapping and related technologists and technicians. They suggest that employment of these workers actually may be declining. The utilization of mapping technologies, such as the Global Positioning System (GPS), Geographic Information Systems (GIS) and remote sensing, has increased the accuracy and productivity of these professionals. Consequently fewer technologists and technicians may be required to complete the same amount of mapping.

Higher expectations in product quality from the public and the desire and need to create new products that meet consumer needs in an increasingly competitive environment should promote employment opportunities for industrial designers. In furniture, the development of tastes for top-of-the-line products and originality may increase the demand among manufacturers for the services of industrial designers to create new product lines. Designing office machines, biomedical equipment, environmental protection systems and transportation design are all niches that could provide job opportunities in the future.

Employment of architectural technologists and technicians is highly dependent on activities in the construction industry. As with drafters, CAD technology also has been increasing the productivity, and consequently restricting the employment growth, of these professionals. Improvements and growing use of CAD technology have also encouraged many engineers and architects, particularly younger ones, to do the conceptual design and production tasks once done by technicians and technologists.

Given that there are so few openings projected for survey technologists and technicians, competition for these openings will be high. Those who are experienced and skilled with new computer based technologies will have an advantage over others when competing for employment opportunities in this field.

As with many other professional and technical occupations involved in business services, work is increasingly likely to be offered in the form of contracts for specific projects or periods of time. A growing number of technologists are forming their own companies, and the proportion of workers within this occupational group who are self-employed should continue to rise.

Growth and advancements in technology are taking place at an astonishingly rapid rate. For this reason, it is useful for professionals in all of these fields to keep abreast of developments within their area of expertise. Periods of retraining and professional development are common for these professionals. Those who have updated skills and knowledge have an advantage over others in competing for employment opportunities in these fields.

Advancement to senior and project leader positions is possible with experience. There is mobility among different areas within this field. As well, drafting technicians and technologists may move into occupations dealing with civil, mechanical or other engineering design technologies with additional education or work specialization. Architectural technicians and technologists may be able to transfer to other fields, such as civil engineering, sales, real estate or construction estimating and inspection. Industrial designers may be able to transfer to other types of design work.

Related Occupations

- technical occupations in physical sciences (221)
- electrical and electronics engineering technologists and technicians (2241)
- technical occupations in civil, mechanized and industrial engineering (223)
- other technical inspectors and regulatory officers (226)
- creative designers and craftspersons (524)

As with many other professional and technical occupations involved in business services, work is increasingly likely to be offered in the form of contracts for specific projects or periods of time. A growing number of technologists are forming their own companies, and the proportion of workers within this occupational group who are self-employed should continue to rise.

Other Technical Inspectors and Regulatory Officers

NOC 226

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	3,030	5,140	6,570

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
1,430	300	1,730

Annual Growth 1998-2008 2.5%

Main Industries of Employment

Retail Trade	37%
Local and Other Administration	12%
Provincial and Territorial Administration	10%

Employment by Region

Lower Mainland	53%
Vancouver Island	18%
Northern B.C.	13%
Okanagan/Kootenay	16%

Self-employment 6%

Nature of the Work

Inspectors and *regulatory officers* work in government, architectural and civil engineering consulting firms, construction, manufacturing, processing, transportation and energy companies and industrial inspection companies. They enforce adherence to a wide range of laws, regulations, policies and procedures that protect the public. Workers in this occupational group are employed in both the public and the private sectors and may also be self-employed.

Non-destructive testers and *inspectors* operate ultrasonic, liquid penetrant, magnetic particle and other testing equipment to detect defects in objects of different compositions and materials.

Engineering inspectors and *regulatory officers* inspect aircraft, boats, ships, cars, trucks, weighing and measuring devices, as well as industrial instruments, processes and equipment.

Inspectors in *public health, environmental health* and *occupational health and safety* inspect restaurants, plants, hotels, water systems and some other workplaces.

Construction inspectors inspect the construction and maintenance of buildings, bridges, highways and industrial construction to ensure compliance with building codes and ordinances, zoning regulations and contract specifications.

Main Duties

Depending upon their employer, the duties of *inspectors* and *regulatory officers* vary widely. Professionals in this occupational group work with experts in various disciplines to ensure compliance with public health and safety regulations. They conduct inspections to ensure compliance with regulations that govern product labelling and quality. Workers in this group prevent the spread of foreign plants, animal pests and diseases by conducting inspections. They also conduct inspections to ensure that food, water and air meet government standards and that regulations relating to environmental health and safety, transportation and work place safety are enforced. Workers in these occupations also enforce laws and regulations concerning the immigration of people, as well as the import and export of various products.

Example Titles

- public health inspector
- agricultural quarantine inspector
- occupational safety and health inspector
- food damage inspector
- environmental health inspector
- construction inspector
- building inspector
- aviation safety inspector
- motor vehicle inspector
- elevator inspector
- plumbing inspector
- home inspector

Education and Training

The amount of training needed to work in this field varies, depending on the specific work. To become a *non-destructive tester*, completion of secondary school may be sufficient, but completion of two years of engineering study at a college or university is typical. Additional classroom and on-the-job training is required for certification. Certification, granted by the Canadian General Standards Board, is available at three different levels and may be required by some employers. Special licences may be required to administer some types of tests, and non-destructive testers must keep abreast of new developments in technologies, procedures and materials.

Engineering *inspectors* and *regulatory officers* may obtain work based on trade qualifications and extensive related work experience or by obtaining a post secondary diploma or degree in an appropriate engineering field. Certification and licensing may be required by some employers.

Generally, completion of a post secondary diploma or degree in an area such as food science, environmental health or studies, chemistry, or health and safety, is required in order to work as an inspector in the areas of public and environmental health and occupational health and safety. However, several years of related work experience and completion of in-house training programs may suffice. *Public health inspectors* must be certified by the Canadian Institute of Public Health Inspectors. *Occupational health and safety officers* may require registration with the Association for Canadian Registered Safety Professionals. This registration requires three years of experience in the field and passing a written examination.

Construction inspectors must complete secondary school and a post secondary diploma in construction, civil engineering or architectural technology, as well as obtain several years of related work experience. In some cases, several years experience as a qualified tradesperson in a construction trade, such as plumbing, carpentry or electricity, may serve as a substitute for a college education. Provincial certification in a skilled trade or as an engineering technologist is usually required.

Individual courses of study in some of these fields of work are available at various B.C. educational institutions.

Non-destructive testing courses are available at the British Columbia Institute of Technology (BCIT).

As well, BCIT has two-year diploma programs in chemical sciences technology, occupational health and safety, and environmental health. Certification as a public health inspector is possible after completion of the environmental health program, 12 weeks of supervised field work and a certification examination.

The University of British Columbia (UBC) offers bachelor's, master's and doctoral degrees in food science, as well as master's and doctoral degrees in health care and epidemiology for those who have prerequisite bachelor's degrees in health or a related science. Those with an undergraduate degree in an area such as physical or health science, or engineering, can apply to enter a master's program in occupational hygiene at UBC, and doctoral work can be conducted through an interdisciplinary route.

Camosun College has a two-year diploma program in environmental technology. Graduates will have up to two years of transfer credit that they can use to enter a third year university program in environmental studies. Nearly all B.C. universities offer bachelor's degrees in environmental science. The University College of the Cariboo offers a bachelor of science degree with an environmental chemistry major, while Douglas College and North Island College both offer associate of arts and science degrees with environmental science options. Capilano College offers a one-year diploma program in environmental science. A bachelor's degree is also required in order to apply to SFU's two-year Environmental Toxicology master's program.

An Environmental Assessment Diploma is available from North Island College, while Kwantlen University College offers a diploma in environmental protection technology. Northern Lights College offers a diploma in land and resource management.

Generally, people who do this type of work must be patient and organized, good observers and detail-oriented, and must have good hand-eye coordination and enjoy routine and organization. They should have an interest in science and mathematics and strong analytical and communication skills. They should be able to work well on their own. Good hearing and colour vision may be necessary, and research and investigation skills may be required. Computer skills are often an asset.

See Technical Occupations in Civil, Mechanical and Industrial Engineering (223), and Technical Occupations in Electronics and Electrical Engineering (2241) for information on college and institutional engineering programs. See also

Civil, Mechanical, Electrical and Chemical Engineers (213) for information on university degree programs in these fields. See Technical Occupations in Architecture, Drafting, Surveying and Mapping (225) for information on architectural technical programs.

Working Conditions

Technical inspectors and *compliance officers* meet people and work in a variety of environments. Their jobs often involve considerable field work and frequent travel. They may experience unpleasant or even dangerous working conditions. For example, mine safety and health inspectors are often exposed to the same hazards as miners. Workers in this occupation may also find themselves in adversarial roles when the group being inspected does not want them there.

Construction and *building inspectors* usually work alone. However, several may be assigned to a large, complex project. They may spend much of their time in a field office reviewing blueprints, answering letters or telephone calls, writing reports and scheduling inspections. The rest of their time is spent inspecting construction sites. Inspection sites may be dirty and cluttered with tools, materials or debris. Although the work is not considered hazardous, inspectors often wear hard hats for safety. Construction and building inspectors normally work regular hours.

The 1995 estimated average earnings for all B.C. workers in this occupational group were $41,900, well above the provincial all-occupation average of $27,900. There were some variations in earnings among the occupations in this group. At the high end, those who worked full time for the full year as *inspectors* in *public and environmental health* earned an average of $50,100. Those who worked full time for the full year as *non-destructive testers* and *inspectors* were at the low end, with an average of $44,200. In any case, these levels of earnings are well above the provincial average for 1995 of $39,400. A survey of recent college graduates found a range of earnings for new entrants to these occupations. At the high end, inspectors in public and environmental health earned an average of $3,260 per month ($39,100). Engineering inspectors and regulatory officers were at the low end, with average earnings of $2,330 per month ($28,000).

The number of workers employed as technical inspectors and regulatory officers increased by 70% between 1990 and 1998, with approximately 5,140 employed in 1998. Engineering inspectors and regulatory officers accounted for 54% of this growth. In total, inspectors in public and environmental health represent 33% of all workers in this occupational group, construction inspectors represent 23%, engineering inspectors and regulatory officers represent 36%, and non-destructive testers represent 7%. About 69% of all workers were employed full time, for the whole year, and another 21% worked full time for part of the year. Part-time work is well below the provincial average, with 10% working part time. The all-occupation rate for part-time employment in B.C. is 26%. Unemployment is also lower than the average for all occupations. In general, self-employment is low for workers in these occupations (less than 10%), compared to the all-occupation average of 15%. However, 13% of construction inspectors report being self-employed.

Workers in these occupations are employed in the retail trade (37%), local government (12%), provincial government (10%) and construction (7%). The geographic distribution of workers is reasonably close to the average for all occupations. About 53% are located in the Lower Mainland, 18% on Vancouver Island, 16% in the Okanagan/Kootenay region and 13% in Northern B.C.

Men dominate this occupational group. Women account for only 14% of the workers. By comparison, women account for 46% of all workers in the province. The average age of workers in these occupations is 43, five years older than the provincial all-occupation average. There were less workers in the 15 to 34 age group (21%) than the provincial average (40%) and more workers in the 35 to 54 age group, with 65% compared to 49% for the all-occupation average. This age difference may reflect a preference for mature and experienced workers to inspect workplaces and products and then enforce regulations.

Employment Prospects

This is a large occupational group, made up of about 5,140 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment in this group to grow at an annual rate of 2.5%, much faster than the average for all occupations. According to this projection, 1,730 positions will become available from 1998 to 2008. A little over 80% of these openings will come from growth in the number of new positions, and the remainder will come from the need to replace workers who retire.

Growing consumer pressures for safer and more environmentally friendly products are a significant source of employment growth for these workers. These pressures are causing the private sector to become increasingly concerned with the social and economic cost of not complying with sanitary or environmental standards. There are also pressures from workers in all industries and from government to increase health and safety standards in the workplace. Additional openings will become available from the inspection and study of the impact of new equipment and technologies on occupational health and safety, public health and the environment. Most job opportunities will be in the retail trade, construction and professional business services industry. Very few new government positions are expected to be created due to government restraint.

The shift away from employment in government to employment in the private sector will also mean more contract work and self-employment. Individuals will find it helpful to have business operating skills. Some consulting firms offer business evaluation and inspection services, providing technical expertise and compliance knowledge for the growing small business industrial sector.

Technology is changing methods of inspection, providing both labour-saving tools and methods, but also increasing the capacity to monitor more closely. For this reason, it is useful for workers in all of these fields to keep abreast of developments within their area of expertise. Periods of retraining and professional development are common for these workers. Those who have updated skills and knowledge have an advantage over others in competing for employment opportunities in these fields.

Additional Information

Canadian Institute of Public Health Inspectors, B.C. Branch
http://www.bc-ciphi.cnx.net

Association for Canadian Registered Safety Professionals
http://www.acrsp.ca

Related Occupations

- technical occupations in civil, mechanical and industrial engineering (223)
- medical technologists and technicians (321)
- other occupations in protective service (646)

Transportation Officers and Controllers

NOC 227

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	6,270	6,040	7,220

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
1,180	690	1,870

Annual Growth 1998-2008 1.8%

Main Industries of Employment

Air Transportation	46%
Water Transportation	27%
Non-Metallic Minerals	5%

Employment by Region

Lower Mainland	56%
Vancouver Island	29%
Northern B.C.	6%
Okanagan/Kootenay	9%

Self-employment 7%

Nature of the Work

Pilots fly fixed-wing aircraft and helicopters to provide air transportation and other services. *Flight engineers (second officers)* monitor the functioning of aircraft during flight and may assist in flying the aircraft. *Flying instructors* teach flying techniques and procedures to student and licensed pilots. Air pilots, flight engineers and flight instructors are employed by airline and air freight companies, flying schools, the armed forces and other public and private sector aircraft operators.

Air traffic controllers direct air traffic within assigned airspace and control moving aircraft and service vehicles at airports. *Flight dispatchers* authorize airline flights over assigned routes. Flight service specialists provide pilots with flight information essential to aviation safety. *Air traffic controllers* and *flight service specialists* are employed by the federal government, including the armed forces. *Flight dispatchers* are employed by airline and air services companies and the armed forces.

Deck officers of water transport operate ships or self-propelled vessels to transport passengers and cargo over oceans as well as coastal and inland waters. They also supervise and coordinate the activities of deck crews. This group includes Canadian Coast Guard deck officers. They are employed by marine transportation companies and federal government departments, including the armed forces.

Engineer officers of water transport operate and maintain main engines, machinery and auxiliary equipment aboard ships and other self-propelled vessels as well as supervise and coordinate the activities of engine room crews. Like deck officers of water transport, they are employed by marine transportation companies and federal government departments, including the armed forces.

Railway traffic controllers coordinate passenger and freight train traffic on railways. They are employed by rail transport companies. *Marine traffic controllers* monitor and regulate coastal and inland marine traffic within assigned waterways. They are employed by port, harbour, canal and lock authorities and the Canadian Coast Guard.

Main Duties

Pilots fly fixed-wing aircraft or helicopters to transport passengers and freight and provide services, such as search and rescue, aerial surveying or spraying, and crop dusting. They also direct the activities of aircraft crew during flights as captain of the aircraft. They co-pilot aircraft and perform captains' duties, if required, as first officer. They test new aircraft to evaluate performance, and they train pilots to use new equipment or prepare them for examination to revalidate or upgrade existing licences.

Flight engineers (second officers) monitor the operation of engines, fuel consumption and functioning of aircraft systems during flights, as well as assist the captain and first officer in the operation of aircraft as second officer.

Flying instructors instruct student pilots in procedures and techniques of flying aircraft and in ground-school subjects, such as navigation, radio procedures and flying regulations. They also train licensed pilots for additional certification.

Air traffic controllers control the flow of air traffic within assigned airspace, using radar monitors, radio and other communication equipment and visual references, as well as issue aircraft takeoff and landing instructions to pilots. They relay meteorological, navigational and other information to pilots in flight. They maintain radio and telephone contact with adjacent control towers, terminals and other control centres, and they coordinate movement of planes into adjoining areas. They also alert airport emergency services when aircraft are experiencing difficulties, report missing aircraft to search and rescue services, and direct activities of all moving aircraft and service vehicles on or near airport runways.

Flight dispatchers analyse environmental conditions and assess aircraft for load and fuel capacity and other factors to determine flight routes. They brief the flight crew before takeoff on weather conditions and the status of navigational facilities and airports en route. They also co-sign flight authorization with the aircraft captain, monitor the progress of flights and communicate as required with aircraft during flights. In addition, they delay or cancel flights, if conditions warrant, and they prepare and maintain flight plans, flight logs and other reports.

Flight service specialists provide pre-flight information concerning weather, radio frequencies, terrain, airports and related data to assist pilots in preparation of flight plans. They check flight plans for completeness and accuracy and forward plans to air traffic control units or notify aircraft destinations of flight plans. They also respond to radio calls from aircraft preparing for takeoff or landing and supply information, such as weather conditions, wind speed and direction, and presence of local air traffic. In addition, they support air traffic control operations by relaying radio requests for flight clearances, arrival and departure information, and position reports.

Deck officers of water transport command and operate ships or other self-propelled vessels, such as barges or oil rigs, to transport passengers and cargo. They command and operate coast guard vessels to provide ice breaking and search and rescue services and to maintain control over ships operating in Canadian waters. They plan and execute safe navigational passage using navigational aids, determine geographical position using navigational instruments and charts, and guide vessels in rivers, canals, and other confined or hazardous waters and waterways. They also maintain vessels' navigational instruments and equipment, direct and oversee loading and unloading of cargo, supervise and coordinate activities of deck crews, and record vessels' progress, crews' activities, and weather and sea conditions in the ship's log.

Engineer officers of water transport operate main engines, machinery and all auxiliary equipment aboard ships, such as boilers, steering and deck machinery, motors, pumps, generators and condensers. They stand engine room watch, monitoring and noting performance of engines, machinery and all auxiliary equipment. They inspect and conduct maintenance and emergency repair to engines, machinery and all auxiliary equipment. They supervise and coordinate activities of engine room crew, and they maintain records and prepare reports on engine performance and failures.

Railway traffic controllers operate and monitor centralized traffic control systems to coordinate and follow railway traffic, chart train movements, calculate arrival and departure times, and record rail traffic information. They issue train orders to control the movement of passenger and freight train traffic and on-track mobile maintenance equipment. They receive, record and relay train orders to train crew by hand or radio telephone, and they may supervise and train other railway traffic controllers.

Marine traffic controllers direct and monitor vessel movements using radar or closed circuit monitors, remote radio systems and other telecommunication equipment. They obtain position, course, speed and estimated arrival time of vessels and monitor vessel progress through traffic zones. In addition, they issue clearance instructions to vessels, advise vessels of traffic volumes and weather conditions, and relay information to the next marine traffic control sector. They also report accidents, distress signals, navigational hazards and other emergencies to authorities. They maintain radio and telephone contact with adjacent marine control sectors and with vessels within area of jurisdiction, and they maintain a log of vessel movements, size and structure.

©Stone/Vancouver

Example Titles

air pilots, flight engineers and flying instructors (2271):

- chief pilot
- military pilot
- chief flying instructor
- test pilot
- helicopter pilot
- second officer
- check pilot
- pilot instructor
- co-pilot

air traffic control occupations (2272):

- air traffic control chief
- tower controller, air traffic
- flight dispatcher
- air traffic controller
- flight service specialist

deck officers, water transport (2273):

- navigation officer, coast guard vessel
- watchkeeping officer, coast guard vessel
- first mate, ship
- second mate, ship
- ship's mate
- ship pilot

- ferryboat master
- tugboat captain
- master mariner
- ship's captain
- third mate, ship
- maritime surface and sub-surface officer - military

engineer officers, water transport (2274):
- chief engineer officer
- fourth engineer officer
- marine engineer officer
- marine engineer officer - military
- second engineer
- third engineer

railway and marine traffic controllers (2275):
- train dispatcher
- marine traffic regulator
- chief train dispatcher
- train operator
- train dispatch operator

Education and Training

The amount and type of training needed to work in this field varies, depending on the specific work. To work as a *pilot, flight engineer*, or *flight instructor*, completion of secondary school and graduation from a certified flying or aviation school is required, and a commercial pilot's licence is necessary. Some positions may require a post secondary diploma or degree. Structured training may be provided by an employer. In addition, pilots require specialized endorsements or licences to fly different aircraft, as do flight instructors to provide instruction on different types of aircraft. Good health and eyesight are mandatory.

Those who wish to work in air traffic control as *traffic* and *tower controllers, control chiefs, flight dispatchers* and *service specialists* must complete secondary school and obtain a basic radio telephone operator's licence. Controllers and flight service specialists must complete a Transport Canada training program, which includes structured in-class and on-the-job training. Controllers must also meet licensing requirements. Security and medical clearances are required. Flight dispatchers usually require experience in air traffic control and flight operations and may also require a private pilot's licence.

Deck officers must complete secondary school and obtain a deck officer certificate of competency, issued by Transport Canada. Engineer officers must complete secondary school, hold a 4th class certificate issued by Transport Canada and complete one of four options. These include a three-year cadet program in marine engineering from an approved marine training institute, three years' or more experience as an engine room crew member followed by six months of formal training at an approved marine training institute, three years' or more experience as an engine mechanic and six months' experience as an engine room crew member, or a four-year apprenticeship as a marine engineer followed by experience as an engine room crew member.

Prerequisites for entering the apprenticeship include grade 12 or equivalent, with English 12 and grade 11 algebra or trade mathematics, and physics or science and technology 11, as well as completion of an accredited diesel engine course. The apprenticeship involves technical training at the British Columbia Institute of Technology (BCIT) Pacific Marine Training Campus in Vancouver and a period of on-the-job training. The certification program administered by Transport Canada allows progression to different levels of certification based on experience, training and testing, and the probability of employment increases with each advancement to a higher level.

Railway and *marine traffic controllers* usually require completion of secondary school. Railway traffic controllers require several years' experience in the railway industry and up to six weeks of classroom and on-the-job training. Railway controllers who are train dispatchers require a Level "A" Certificate of the Canadian Rail Operating Rules. Those who are train operators require Level "B" certification. Marine traffic controllers require several months of formal training.

Okanagan University College, and Selkirk College offer two-year commercial aviation diplomas. Prerequisites to these programs include a private pilot's licence, a medical certificate and successful entrance examinations. The University College of the Fraser Valley (UCFV) in cooperation with Pacific Coastal Aviation offers one-, two- and four-year aviation training programs. The one- and two-year programs involve training for a commercial pilot's licence, with additional specialized training in multi-engine and instrument training with an optional flight instructor rating. The four-year degree program offers private licence, commercial licence and advanced training and meets the academic requirements of the UCFV Bachelor of Business Administration Program. Prerequisites include a private pilot's licence, a medical certificate and a successful interview.

BCIT's Pacific Marine Training Campus offers a wide variety of courses in the areas of marine engineering, safety and seamanship, and shipping and marine operations. North Island College offers individual courses and programs designed to help commercial mariners prepare for Transport Canada Marine Safety exams. Northwest Community College offers programs for professional mariners as well as those who wish to upgrade and prepare for Transport Canada certification exams. Camosun College has a nautical training program for those with some experience who wish to upgrade. Program length at these institutions varies depending on the courses chosen.

Mobility between employers is possible for deck and engineer officer positions requiring the same level of certification. With experience and certification, train operators may progress to train dispatcher positions, and railway traffic controllers may progress to supervisory positions in rail transport operations. There is little mobility between railway and marine traffic control sectors.

People in this field of work should have an eye for detail, good judgement, good communication skills and leadership qualities and be able to work as part of a team. Fluency in French may be an asset, and good health, hearing and vision are generally necessary. Continual upgrading is necessary in order to be successful. Familiarity and comfort with computers is usually needed, and an active interest in technological change is an asset.

Working Conditions

The working conditions for workers in this group vary with each occupation. *Air pilots* and *flight engineers* can expect irregular work schedules that entail both flying and nonflying duties. Airline pilots are legally restricted to a monthly or annual number of hours they can spend on flights. Because many flights are away overnight (layovers), employers usually provide hotel accommodations, transportation between the hotel and airport and an expense allowance. Airlines offer flights at all hours of the day or night so work schedules are usually irregular, and those workers with seniority generally have a choice of flights. Many airline pilots, especially those working on international routes, experience fatigue from hours of flying through different time zones (also known as jet lag).

Pilots employed outside the airlines also work irregular hours and may spend an even greater proportion of their schedules conducting nonflying duties. Except for business pilots, these non-airline pilots are not usually away from home overnight, but they have to be prepared to deal with emergencies at any hour. *Flying instructors* are often expected to teach weekends or nights. The work of *test pilots,* who check the performance of new and experimental planes, may be dangerous. *Helicopter pilots* involved in police work and fighting forest fires may be exposed to danger and risk of personal injury. *Crop dusters* run the risk of exposure to chemicals, and in some cases, they may not have access to a conventional landing strip.

The stress of being responsible for a safe flight, especially in harsh weather, can be very exhausting. Pilots must be alert and have quick reaction time in case of unexpected mishaps, particularly during takeoffs and landings.

Controllers of air, railway or marine traffic usually work a standard number of hours per week. However, their hours may be irregular because most control towers or centres operate 24 hours a day, 7 days a week so they rotate night and weekend shifts. Controllers must work quickly and efficiently, especially during busy periods. For *air traffic controllers* total concentration is required to keep track of multiple aircraft at the same time and to ensure that all pilots receive correct information and instructions. The stress of being responsible for the safety of these aircraft and all persons aboard can be very exhausting. *Railway* and *marine traffic controllers* can experience similar pressures and demands.

Deck officers and *engineer officers* of water transport can be away from home for extended periods, but they also enjoy long leaves. Some officers assigned to ships on rivers or canals work 8- to 12-hour shifts and go home every day. Others remain aboard the vessel for one or more weeks and then have an extended period off. Although there will be efforts to avoid severe storms, these officers must be prepared to work in cold and damp weather conditions. They must be able to remain calm and efficient in the event of emergencies. Even though it is very rare for a vessel to sink, they must be trained and mentally prepared to abandon ship on short notice. They are also exposed to the risk of hazards associated with working with machinery, heavy loads and dangerous cargo. Many officers must still deal with long periods away from home and confinement aboard a ship, although some newer vessels are equipped with comfortable living quarters as well as air conditioning and soundproofing.

In 1995 the average annual earnings for all workers in this occupational group were $57,800. Those who worked full time for the full year received $65,600 in earnings. The respective all-occupation averages in the province in 1995 were $27,900 and $39,400. The average earnings for those in full-time, full-year jobs varied among the occupations. At the high end were air pilots, flight engineers and flying instructors, who earned an average of $75,700. At the low end were railway and marine traffic controllers, who earned an average of $49,200. According to a survey of recent college graduates who found work as pilots, flight engineers and flying instructors, the average earnings were reported to be $2,550 per month ($30,600 per year). College graduate data was also available for new entrants to the occupation of water transport deck officers. Their average earnings were $3,680 per month ($44,100 per year).

The number of employed workers in this large occupational group declined from 6,270 in 1990 to 6,040 in 1998. While water transport deck officers added 100 workers over this eight-year period, water transport engineer officers and railway and marine traffic controllers lost about 130 workers each. In total, 40% of the workers in this occupational group are air pilots, flight engineers or flying instructors, 29% are water transport deck officers, 11% are water transport engineer officers, 9% are air traffic controllers, and another 10% are railway or marine traffic controllers.

There are relatively few workers in this group who are either self-employed (7%) or employed part time (7%).

Unemployment varies among the different occupations within this group. Among air pilots, flight engineers, flying instructors and air traffic, railway and marine traffic controllers, unemployment is lower than the average for all occupations. However, among water transport deck officers and water transport engineer officers, unemployment is about the same as the average for all occupations.

About 60% of the entire group work full time, year round, and another 33% work full time for part of the year. Full-time employment for only part of the year is the case for just 18% of railway and marine traffic controllers and 19% of air traffic control workers, but it is more common among water transport engineer officers (47%), water transport deck officers (41%) and air pilots, flight engineers and flying instructors (31%).

The industries in which the largest numbers of workers in this occupational group are found are air transport (46%) and water transport (27%). Other industries in which these workers are employed include the federal government and rail transport.

About 56% of the workers in this group are located in the Lower Mainland, which is about the same proportion as the all-occupation average. However, the representation of this group on Vancouver Island (29%) is higher than average. As for the balance of workers, 9% are located in the Okanagan/Kootenay region, and 6% are located in Northern B.C. At an individual occupation level, it is worth noting that water transport deck officers and engineer officers have a higher than average concentration on Vancouver Island (43% and 42% respectively). Both have 43% of their workers on Vancouver Island. In addition, more than half of each of these Vancouver Island water transport workers are located outside of the Victoria area.

Women account for only 7% of the entire group, but they have somewhat higher representations among air traffic control workers (25%) and among railway and marine traffic controllers (26%). By comparison, the provincial all-occupation average representation of women workers is 46%.

The representation of workers aged 35 to 64 in this occupational group (75%) is higher than for the all-occupation average (58%). This reflects the greater levels of training and work experience required as well as the advanced levels of maturity and life experience expected for workers in this group. The average age for workers is 43.

Employment Prospects

This is a large occupational group, made up of about 6,040 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment in this group to grow at an annual rate of 1.8%, about as fast as the average for all occupations. According to this projection, 1,870 positions will become available from 1998 to 2008. Almost two-thirds of these openings are projected to result from growth in the number of new positions, and the remainder will result from the replacement of retired workers.

Half of all workers in this group are either *air pilots, flight engineers* and *flying instructors* (40%) or *air traffic control officers* (9%). Almost all of these workers are employed in the air transportation industry. A major source of uncertainty in the employment forecast is the restructuring underway in the airline industry. In January 2000 Air Canada took over ownership of Canadian Airlines, and the effects of this are not yet clear. Although Air Canada has announced that there will be no involuntary layoffs, some industry analysts predict that the number of workers currently working for the two airlines will decline by 10% in the short term. There is disagreement among industry sources about the effects that this merger, which directly affects the employment of these workers, will have on the amount of Canadian air traffic in the long term. These factors are directly linked to the employment prospects of these workers. Some industry sources suggest that the reduction in competition will push air ticket prices up and consequently reduce the overall amount of air traffic. Other industry sources suggest that the merger will reduce the destructive components of domestic competition among airlines and increase the overall efficiency of the airline industry. Some of these savings may be passed on to consumers in the form of lower ticket prices which may ultimately increase the amount of Canadian air traffic.

One source of employment growth in the air transportation industry is the increased business and personal air traffic from Asian countries resulting from growth in their economies. Vancouver is a key air transport centre, particularly for Canadian and Northwestern U.S. connections to Asia.

Competition for entry-level airline pilot positions has always been high, and this will continue to be the case. New entrants to this field often move to northern areas in order to gain flying experience working for smaller companies. Some individuals may find work as flight instructors for schools offering flight training for hobby flyers. Competition for flight engineering positions will also continue to be high. Technological progress has almost entirely eliminated the need for these workers on aircraft because many of their duties are now being handled by computer systems.

According to industry sources, many openings will become available for helicopter pilots. A growing number of helicopters are being used in the logging and forestry sector to enable loggers to cut trees selectively. The use of helicopters also offers an environmental alternative to building logging roads, which results in the unnecessary loss of trees.

Air traffic controllers are rarely employed for more than 25 years because of the high stress level associated with their work. This will continue to ensure a high requirement to replace workers who retire. This occupation has also been undergoing many changes due to technological innovations, such as growing computerization in establishing flight plans, communication methods with pilots and co-pilots, takeoff and landing operations, routine checks of air traffic control, definition of air corridors and collection centres for meteorological data. Air traffic controllers need to be familiar with these innovations.

Employment of *railway* and other *marine traffic controllers* is projected to grow much faster than the average for all occupations. Employment prospects for these workers are affected by many of the same factors and influences as their counterparts in air traffic control occupations.

Employment of *deck officers* is projected to grow more slowly than the average for all occupations. The use of technologies, such as automated controls and computerized monitoring systems for navigation, engine control, watchkeeping, cargo handling and ship management, is growing. These technologies are enabling ships to be operated safely by progressively smaller crews including fewer deck officers. Deck officers who are able and willing to navigate on foreign boats potentially will have the most job opportunities. Some deck officers are referred to as navigation officers. These workers must have excellent knowledge of cartography, meteorology, astronavigation and electronics as well as ship stability and construction. Judgment, responsibility, initiative, communication skills and the ability to work in a team are also desirable qualities. Deck officers can advance to management positions in marine enterprises or to positions as marine experts, inspectors or harbour masters in the public service.

Employment of *engineer officers* is projected to grow more slowly than the average for all occupations. Since this is also a very small occupation, only a small number of openings will become available in this field (110 in total). Engineer officers must be knowledgeable in the areas of thermodynamics, electrotechnology, the principles of marine engineering and the workings of marine engines using internal combustion or steam. As with deck officers, engineer officers need judgment, responsibility, initiative and the ability to work on a team. Dexterity is also desirable. Engineer officers can transfer their expertise to jobs in other areas, such as hydroelectric plants or wastewater treatment plants.

It is essential that professionals in these fields keep abreast of developments within their area of expertise. Periods of retraining and professional development are common for careers in any of these fields. Technicians and technologists who have updated skills and knowledge have an advantage over others in competing for employment opportunities.

Additional Information

Coastal Pacific Aviation
http://www.coastalpacific.com/cpa/index.html

Industry Training and Apprenticeship Commission
http://www.itac.gov.bc.ca

Transport Canada http://www.tc.gc.ca

Related Occupations

deck officers, water transport (2273):
- deck crew, water transport (in 743 other transport equipment operators and related workers)
- engine room crew, water transport (in 743 other transport equipment operators and related workers)
- fishing masters and officers (in 826 fishing vessel masters and skippers and fishermen/women)
- shore captains (in 01/09 middle and other management)

engineer officers, water transport (2274):
- deck crew, water transport (in 743 other transport equipment operators and related workers)
- engine room crew, water transport (in 743 other transport equipment operators and related workers)
- transportation managers (in 01/09 middle and other management)
- marine and naval engineers (in 214 other engineers)
- marine mechanical engineers (in 213 civil, mechanical, electrical and chemical engineers)

railway and marine traffic controllers (2275):
- supervisors, railway transport operations (in 722 supervisors, railway and motor transportation)
- subway traffic controllers and light rail transit dispatchers (in 722 supervisors, railway and motor transportation)

Competition for entry-level airline pilot positions has always been high, and this will continue to be the case. New entrants to this field often move to northern areas in order to gain flying experience working for smaller companies. Some individuals may find work as flight instructors for schools offering flight training for hobby flyers.

2

© Stone/Vancouver

3 - HEALTH OCCUPATIONS

Skill Level A - Professional Occupations

3111 Specialist Physicians 194
3112 General Practitioners and Family Physicians 196
3113 Dentists 199
3114 Veterinarians 201
3121 Optometrists 204
3122 Chiropractors 207
3123 Other Professional Occupations in Health Diagnosing and Treating 209
3131 Pharmacists 212
3132 Dieticians and Nutritionists 215
314 Therapy and Assessment Professionals 217
3152 Registered Nurses 221

Skill Level B - Technical, Paraprofessional and Skilled Occupations

321 Medical Technologists and Technicians (Except Dental Health) 226
3220 Dental Technicians and Laboratory Bench Workers 231
3221 Denturists 233
3222 Dental Hygienists and Dental Therapists 235
3231 Opticians 238
3232 Midwives and Practitioners of Natural Healing 240
3233 Registered Nursing Assistants 243
3234 Ambulance Attendants and Other Paramedical Occupations 247
3235 Other Technical Occupations in Therapy and Assessment 250

Skill Level C - Intermediate Occupations

3411 Dental Assistants 254
3413 Nurse Aides and Orderlies 256

Specialist Physicians

NOC 3111

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	2,550	3,560	4,290

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
730	470	1,200

Annual Growth 1998-2008 1.9%

Main Industries of Employment

Physicians, and Health Practitioners and Medical Labs	62%
Hospitals	31%
Education	4%

Employment by Region

Lower Mainland	71%
Vancouver Island	16%
Northern B.C.	4%
Okanagan/Kootenay	9%

Self-employment 60%

Nature of the Work

This unit group includes specialist physicians in clinical medicine, in laboratory medicine and in surgery. *Clinical medicine specialists* diagnose and treat diseases and physiological or psychiatric disorders and act as consultants to other physicians. *Laboratory medicine specialists* study the nature, cause and development of diseases in humans. *Surgeons* perform and supervise surgical procedures. Clinical medicine specialists usually work in private practice or in a hospital while those in laboratory medicine and in surgery usually work in hospitals. Residents and interns in training to become specialist physicians are included in this unit group.

Main Duties

Clinical medicine physicians examine, diagnose and treat diseases and physiological or psychiatric disorders. They also order laboratory tests, X-rays and other diagnostic procedures and prescribe medication and treatment or refer patients for surgery if necessary. They may also conduct medical research. For example, pediatricians diagnose problems, such as communicable diseases, congenital abnormalities, or developmental and behavioural problems. Another example is psychiatrists, who care for people with acute and chronic mental illness, such as depression, schizophrenia and manic depression, and who may also see patients with emotional or psychological problems.

Laboratory medicine physicians, or *pathologists*, working with other health care providers, use laboratory methods to diagnose illness, to detect sources of illness in the community, to track the progress of illness in the individuals and in the community, and to screen populations for some illnesses. They participate in the day-to-day care of hospital patients by providing and interpreting laboratory information to help solve diagnostic problems and to monitor the effects of therapy. They work closely with other physicians in the management of diseases such as cancer, anemia and diabetes. They also teach medical students and practicing physicians in classrooms and seminars and at conferences. Pathologists may also be involved in forensic pathology. Pathologists should be good at using computers extensively, including computers that are part of laboratory instruments and that deal with data generated in the laboratory.

Surgeons work closely with other physicians to assess patients' diseases or disorders and determine appropriate surgical procedures. For example, a cardiovascular surgeon may consult with a geriatrician to determine the appropriate surgical plan. Surgeons perform and supervise the surgical procedures. They should work with precision and work well under stress.

Example Titles

clinical medicine physicians (3111.1):

- anesthetist
- cardiologist
- dermatologist
- endocrinologist
- gastroenterologist
- geriatrician
- nephrologist
- neurologist
- pediatrician
- physiatrist
- psychiatrist
- radiation oncologist
- rheumatologist

laboratory medicine physicians (3111.2):

- anatomical pathologist
- general pathologist
- hematological pathologist
- medical biochemist
- medical microbiologist
- neuropathologist

surgeons (3111.3):

- cardiovascular and thoracic surgeon
- general surgeon
- gynecologist
- neurosurgeon
- obstetrician
- ophthalmologist
- orthopedic surgeon
- otolaryngologist

- plastic surgeon
- thoracic surgeon
- urologist

Education and Training

All *specialist physicians* must complete a Doctor of Medicine (MD) degree at an approved medical school, and clinical specialty training, followed by successful completion of qualifying examinations set by the Royal College of Physicians and Surgeons of Canada, and licensing by the College of Physicians and Surgeons of British Columbia. In addition, all specialist physicians must hold a Licentiate from the Medical Council of Canada.

For a description of programs that lead to an MD designation see the profile General Practitioners and Family Physicians (3112).

The University of British Columbia (UBC) is the only university in B.C. to offer specialist physician training. Specialties offered through UBC's Faculty of Medicine and its affiliated hospitals include anesthesia, community medicine, family practice, internal medicine and its subspecialties, medical microbiology, medical genetics, obstetrics and gynecology, ophthalmology, orthopedics, pediatrics, pathology, psychiatry, radiation oncology, radiology and surgery.

Specialty training includes a variety of configurations of theory and practice depending on the individual specialty. Selection of candidates for each specialty is at the discretion of the program directors of each department to whom the application is made. Depending on the particular specialty, four to six years of specialty training is required.

Working Conditions

Specialist physicians often work long, irregular hours, usually under stress. Many work weekends and evenings to answer emergency calls, and must travel frequently between office and hospital to look after their patients. Often they work in offices that are their own, but they also work in group practices at clinics with other health care providers or in hospitals. The trend toward group practice is increasing, especially for newly trained physicians. This helps them to have more regular work hours, provides the opportunity for peer consultation and helps to reduce their business costs.

The estimated average earnings for specialist physicians in B.C., after expenses, were $116,600 in 1995. The majority of these workers are employed full time, full year, and these specialist physicians' earnings averaged $133,700, with men averaging $144,500 and women averaging $99,400. The all-occupation averages in the province in 1995 for full time, full year workers were $44,800 and $31,300 respectively. Incomes vary depending on specialization, the number of hours worked, location, the number of years in practice and other factors.

This is a medium-sized occupational group. Employment levels for specialist physicians have gone up to 3,560 in 1998. Self-employment is common (60%), although the percentage is not as high as that for physicians in general practice. At 10%, there are about as many part-time specialist physicians as part-time physicians in general practice. By comparison, the rate of self-employment across all occupations in B.C. is 15%. The unemployment rate in this profession is much lower than the provincial average, and employment is not affected by general economic conditions or seasonal fluctuations.

Specialist physicians are mainly employed in physicians' offices, health practices and medical labs (62%) and in hospitals (31%). Specialist physicians are located all over the province. However, they tend to cluster in urban areas, such as the Lower Mainland (71%), where they are close to hospitals and education centres. This has resulted in an oversupply of specialist physicians in these areas and some shortages in Northern B.C.

There is about the same percentage of women specialist physicians (26%) as the percentage of women in general practice, although this proportion is lower than the provincial workforce average of 46%. However, women specialist physicians' share has been increasing. Because they typically go through many years of intensive training before practice, the average age of specialist physicians (47) is higher than that of all occupations and is also higher than the age of physicians in general practice. Although only 2% of the entire B.C. workforce is age 65 or older, 8% of specialist physicians in this age group are still in practice.

Employment Prospects

Health care in B.C. and Canada as a whole has gone through considerable change over the last few years, and more change is expected. Population growth, an aging population and technological advancement in diagnosis and treatment are contributing to increasing demands for health services. We are currently facing worker shortages in some health occupations and have waiting lists for many health services. This pressure is expected to continue in the future and is leading governments to explore alternative options to finance and deliver high quality health care. New approaches to medical service delivery are being considered in conjunction with other policy changes. There may be increased use of the Internet to provide information directly to health consumers as well as to support the delivery of services by health providers. Any of these changes has the potential to influence employment needs. The employment projections in the summary table and following paragraphs, unless otherwise stated, are from the Canadian Occupational Projection System (COPS) demand model. The COPS model draws on traditional health delivery patterns, including the historic relationship between population growth and demand for physicians' services. As a result, COPS may not capture all the impacts of changing technology, delivery models and health policy on the provision of health care services in B.C. The COPS growth rate projected reflects population growth and the provincial budgetary constraints of the past few years.

Employment for *specialist physicians* is projected to grow faster than the average for all occupations through to 2008 resulting in an estimated 1,200 total job openings between 1998 and 2008. This includes 730 openings due to new demand and 470 openings from the replacement of those who retire. The current retirement patterns of specialists physicians suggest that more tend to stay in practice well beyond the usual retirement age.

Some industry sources believe that there are shortages currently for most types of specialist physicians, and they expect that this will continue. This is particularly an issue in Northern B.C. and for all regions in psychiatry, laboratory medicine specialties, general surgery and internal medicine. This factor will provide pressure for additional growth in this occupational group. Other industry sources consider the current situation to be a maldistribution of resources but agree that it will be a pressure for additional growth. Some industry sources believe that medical care needs are growing with our aging population and that health care needs rise sharply with age, both factors contributing to increased demand for services of specialist physicians. Other industry sources dispute such tight connections between aging and increased medical care needs.

New technologies may result in specialist physicians doing more diagnostic tests on patients and may permit more preventive care and interventions. As a result, specialist physicians may perform more procedures and treat more conditions than previously. Based on current student enrolments and the need to replace retiring physicians, some industry sources expect that securing an adequate supply of specialist physicians across Canada over the next 10 years is going to be a major issue. Immigration may be used increasingly to meet these needs.

In response to concerns of shortages of specialist physicians, some provinces are considering increasing the number of places for students in medical schools. Some provinces also advocate introducing new methods of payment for health care and expanding the role of other health care professionals in order to address these concerns.

With experience, specialist physicians can progress to management positions, such as director of laboratory medicine or chief of surgery.

Readers might want to consult other sources, including the B.C. Ministry of Health and professional organizations for specialist physicians, for additional information before making career and training decisions.

Additional Information

Royal College of Physicians and Surgeons of Canada
http://rcpsc.medical.org

College of Physicians and Surgeons of B.C.
http://www.cpsbc.bc.ca/

B.C. Ministry of Health http://www.gov.bc.ca/hlth/

Related Occupations

- chiropractors (3122)
- general practitioners and family physicians (3112)
- managers in health care (in 01/09 middle and other management)
- naturopaths and osteopaths (in 3123 other professional occupations in health diagnosing and treating)

General Practitioners and Family Physicians

NOC 3112

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	2,470	4,400	5,040
Estimated Openings 1998-2008			
	Growth (Net)	Attrition	Total
	640	560	1,200
Annual Growth 1998-2008		1.4%	
Main Industries of Employment			
Physicians, and Health Practitioners and Medical Labs		81%	
Hospitals		16%	
Education		2%	
Employment by Region			
Lower Mainland		61%	
Vancouver Island		19%	
Northern B.C.		8%	
Okanagan/Kootenay		13%	
Self-employment		73%	

Nature of the Work

General practitioners and *family physicians* are the first medical professionals whom patients consult. They diagnose and treat the diseases, physiological and psychological disorders and injuries of patients. They usually work in private practice. *Residents*, in training to be family physicians and previously called interns, are also included in this occupational group.

©Stone/Vancouver

Main Duties

Physicians in general practice and *family physicians* examine patients, obtain medical histories and order laboratory tests, X-rays and other diagnostic procedures. They may consult with other medical practitioners to evaluate patients' health. They prescribe and administer medications and treatments, which may include performing and assisting in routine surgery.

They also perform preventive health care responsibilities. For example, they inoculate (vaccinate) patients, deliver babies and provide pre-natal and post-natal care, and advise patients on diet, hygiene and other preventive care. They also report births, deaths and contagious diseases to governmental authorities.

Example Titles

- family physician
- general practitioner (GP)
- medical doctor (MD)
- resident physician, general practice

Education and Training

All *general practitioners* and *family physicians* must complete a Doctor of Medicine (MD) degree at an approved medical school followed by two years of a clinical training program (previously called an internship) in a family medicine residency. Graduates must also successfully complete qualifying examinations set by the College of Family Physicians of Canada and be licensed by the College of Physicians and Surgeons of British Columbia. In addition all physicians must hold a Licentiate from the Medical Council of Canada.

The University of British Columbia (UBC) offers a four-year program leading to a Doctor of Medicine (MD) degree. Prerequisites include completion of three years of university courses in a faculty of science, arts (including a list of specific prerequisite courses), another faculty at UBC, or the equivalent thereof, with a minimum overall grade average of 70% or equivalent. All prerequisites must be completed by May of the year in which students apply for admission. Prospective students are advised that the number of qualified applicants greatly exceeds the number of places available in the Faculty of Medicine and that the academic standing of those admitted in recent years has been considerably above this minimum required grade. Because admission to medical school is extremely competitive, students should consider applying at several other universities across Canada.

At UBC it is considered desirable that students admitted to the Faculty of Medicine should come from a variety of premedical academic backgrounds, and there is no particular degree program that is looked upon as having unique merits as preparation for the subsequent study and practice of medicine. It should be noted that individuals who complete courses that go beyond fulfilling the prerequisites of the Faculty are not necessarily granted admission. Admission to the MD program is based on Canadian citizenship (B.C. residents are given preference), overall academic record, Medical College Admission Test score (only results from tests taken within five years of the application deadline are acceptable), three references, a non-academic autobiography and an interview if deemed necessary by the admissions committee.

Following the four-year MD program, students are required to undertake two years of postgraduate medical education (residency) in a family medicine training program in Canada in order to become general practitioners or family physicians. Careers in medical specialties require a further four to six years of specialty training depending on the area. For more details on specialty training see the profile Specialist Physicians (3111).

Non-academic qualities of value to those in this field include emotional stability, maturity, integrity, reliability, creativity, motivation, realistic self appraisal, capacity to understand and cooperate with others, social concern and responsibility, scientific and intellectual curiosity, attitude toward continuing learning, problem-solving and decision-making aptitude, ability to communicate verbally and in writing, leadership potential, concern for human welfare and demonstrated high level of performance in any aspect of human endeavour.

Working Conditions

Physicians in general and *family practice* usually work in offices that are their own and act as first contact physicians. They tend to see the same patients on a regular basis for a variety of ailments and preventive treatment. Usually they work long and irregular hours, sometimes under stress, and sometimes on weekends or nights when emergency calls need to be answered. For example, medical residents often work 24-hour shifts and 60 hours a week. Most general practitioners and family physicians must travel between their office and the hospital to care for their patients. As they approach retirement, family physicians tend to accept fewer new patients and work shorter hours.

Physicians in general and family practice may also work in clinical settings with specialist physicians, dentists or other health care providers. In this case, they may be employees or self-employed.

The average earnings for all B.C. general practitioners and family physicians were $85,700 in 1995. Although they generally earn less than specialist physicians, they are still among the highest-paid professionals in Canada. The majority are employed full time, full year, and these physicians' earnings averaged $93,700, with men averaging $100,300 and women $69,900. The all-occupation averages in the province in 1995 for full-time, full-year workers were $44,800 and $31,300 respectively. Incomes vary depending on the number of hours worked, location, the number of years in practice and many other factors.

This is a medium-sized occupational group. There were 4,400 general practitioners and family physicians employed in B.C. as of 1998. The majority are self-employed (73%). By comparison, the rate of self-employment across all occupations in B.C. is 15%. At 10%, there are fewer part-time general practitioners and family physicians than the average for all occupational groups in B.C. (26%). The unemployment rate is much lower than the provincial average. Seasonal fluctuation is rarely seen for this occupation.

General practitioners and family physicians are mainly employed in physicians' offices, health care practices and medical labs (81%) as well as in hospitals (16%). They are located all over the province, reflecting the general distribution of population, although there is a higher than average concentration of general physicians in the Lower Mainland (61%).

There are fewer women physicians in general and family practice (28%) than the all-occupation average (46%), but their share has been increasing. Because of the many years of intensive training involved before they can practise, the average age of general practitioners and family physicians is 44, higher than the provincial average of 38. Compared to most occupations, there is a higher proportion (6%) of physicians in general practice who continue to practise over the age of 65.

Employment Prospects

Health care in B.C. and Canada as a whole has gone through considerable change over the last few years, and more change is expected. Population growth, an aging population and technological advancement in diagnosis and treatment are contributing to increasing demands for health services. We are currently facing worker shortages in some health occupations and have waiting lists for many health services. This pressure is expected to continue in the future and is leading governments to explore alternative options to finance and deliver high quality health care. New approaches to medical service delivery are being considered in conjunction with other policy changes. There may be increased use of the Internet to provide information directly to health consumers as well as to support the delivery of services by health providers. Any of these changes has the potential to influence employment needs. The employment projections in the summary table and following paragraphs, unless otherwise stated, are from the Canadian Occupational Projection System (COPS) demand model. The COPS model draws on traditional health delivery patterns, including the historic relationship between population growth and demand for physicians' services. As a result, COPS may not capture all the impacts of changing technology, delivery models, and health policy on the provision of health care services in B.C. The growth rate projected reflects population growth and the provincial budgetary constraints of the past few years.

Employment for *general practitioners* and *family physicians* is projected to grow at an average rate through to 2008. This is a medium-sized occupational group, with 1,200 projected job openings in B.C. between 1998 and 2008. These include an estimated 640 new jobs due to growth and 560 openings from the replacement of those who retire. Openings due to turnover, which are not included here, are very low because physicians rarely change occupations.

Some industry sources believe that there are currently shortages of physicians in rural areas and in Northern B.C. They expect that this will continue and that it will provide pressure for additional growth for family physicians. Other industry sources consider the current situation to be a maldistribution of resources but agree that it will be a pressure for additional growth. Some industry sources believe that medical care needs are growing with our aging population and that health care needs rise sharply with age, both factors contributing to increased demand for physician services. Other industry sources dispute such tight connections between aging and increased medical care needs.

New technologies may result in general practitioners and family physicians doing more diagnostic tests on patients and may permit more preventive care and interventions. As a result, they may perform more procedures and treat more conditions than previously. Based on current student enrolments and the need to replace retiring physicians, some industry sources expect that securing an adequate supply of physicians across Canada over the next 10 years is going to be a major issue. Immigration may be used increasingly to meet these needs.

In response to concerns of physician shortages in some communities, some provinces are considering increasing the number of places for students in medical schools. Some provinces also advocate introducing new approaches to fund primary care and expanding the role of other health care professionals. One approach suggested would have primary care delivered by multidisciplinary teams consisting of doctors and other health professionals. For example, nurses would work alongside doctors as part of a primary care team and would provide patient care in situations where doctors' skills are not required. This would free doctors to use their skills more effectively.

With additional training, general practitioners and family physicians may become specialist physicians. Competition for admission into such postgraduate training programs is high, as the number of applicants exceeds the number of training positions.

Readers might want to consult other sources, including the B.C. Ministry of Health and professional organizations for family physicians, for additional information before making career and training decisions.

Additional Information

College of Family Physicians of Canada *http://www.cfpc.ca*

B.C. College of Family Physicians *http://www.bccfpc.bc.ca*

B.C. Ministry of Health *http://www.gov.bc.ca/hlth/*

Related Occupations

- chiropractors (3123)
- specialist physicians (3111)
- naturopaths and osteopaths (in 3123 other professional occupations in health diagnosing and treating)

Dentists

NOC 3113

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	2,110	2,860	3,230

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
370	360	730

Annual Growth 1998-2008 1.2%

Main Industries of Employment

Physicians, and Health Practitioners and Medical Labs	97%
Hospitals	1%
Education	1%

Employment by Region

Lower Mainland	62%
Vancouver Island	19%
Northern B.C.	6%
Okanagan/Kootenay	13%

Self-employment 75%

Nature of the Work

Dentists diagnose, treat and prevent disorders of the teeth and tissues of the mouth, as well as related areas of the head and neck. In general practice the emphasis has changed from correction of teeth or mouth problems to the prevention of these problems. Most dentists work in private practice, but they may also be employed in hospitals, clinics, public health facilities or universities.

Main Duties

Most *dentists* are general practitioners who typically are fixing teeth. They examine patients' teeth, gums and jaws to diagnose disease, injury and decay. They remove decay and fill cavities. They clean teeth and instruct patients on oral hygiene, covering topics such as diet, brushing, flossing and the use of fluorides. They extract teeth and make molds and measurements for bridges and for dentures to replace the missing teeth. They administer anesthetics and write prescriptions for antibiotics and other medications.

Dentists use a variety of equipment, including X-ray machines, drills and instruments such as mouth mirrors and forceps. New technologies, such as computer and laser, are becoming more common.

Dentists in private practice have to look after the administration and finance of a small business. They are responsible for developing a client base and creating demand for their services. They may also hire and supervise dental hygienists, dental assistants and dental laboratory technicians.

In addition to general dental practice, there are several recognized dental specialties. All require additional training.

Endodontists use root canal therapy and other supportive measures to preserve teeth showing diseases of the dental pulp. *Orthodontists* study the growth and development of teeth and jaws and straighten crooked or badly spaced teeth. *Periodontists* treat diseases that affect the gums and instruct patients in the prevention of recurrences. They also perform corrective surgery of the gums and supporting bones to treat gum diseases. *Prosthodontists* attempt to restore the natural teeth or replace the missing teeth and adjoining tissues with artificial substitutes, such as bridges and dentures.

Oral and *maxillofacial surgeons* operate upon diseases, injuries or deficiencies of the human jaws.

Oral pathologists study the cause, development and effects of oral diseases using clinical, microscopic, radiographic or other laboratory procedures. They may treat disease directly or provide guidance. Oral radiologists make and interpret radiographs of the head and neck area.

Pediatric dentists specialize in preventive and therapeutic care for children. *Public health dentists* promote public education and the prevention, control and treatment of dental diseases for communities.

Oral medicine is a brand new dental specialty. It is a non-surgical specialty that includes the evaluation, diagnosis, therapeutic management and research into medically related oral diseases.

©Stone/Vancouver

Example Titles

- endodontist
- general practice dentist
- oral medicine specialist
- oral pathologist
- oral radiologist
- oral surgeon
- orthodontist
- pediatric dentist
- periodontist
- prosthodontist
- public health dentist

Education and Training

To practise dentistry in B.C. applicants must complete an accredited general practitioners Dentistry degree, be registered and licensed with the College of Dental Surgeons of B.C. and satisfactorily complete the National Dental Examination Board of Canada examination. To maintain a licence to practise in B.C. the College of Dental Surgeons of B.C. requires evidence of continuing education on a regular basis.

The University of British Columbia (UBC) offers a four-year program in dentistry leading to a Doctor of Dental Medicine (DMD) degree. Prerequisites to the program include completion of three years in a faculty of arts or science program (including approved prerequisite courses) or equivalent, successful completion of the Canadian Dental Association Dental Aptitude Test (DAT) or the American Dental Association Aptitude Test (must be within five years of the application deadline), letters of recommendation and a personal interview. A minimum scholastic average of 75% is required in order to be competitive for admission.

UBC also offers advanced degrees/diplomas for practitioners who wish to enter specialty practice, teaching or research. Postgraduate training is offered in periodontics, oral medicine, oral pathology or oral radiology. Admission requires a DMD or equivalent and admission to graduate school at UBC. Training for each specialty is offered in conjunction with a master's degree in dental science in the form of a three-year program that confers a diploma in the specialty as well as the master's degree. Graduates who wish to practise in the specialty must successfully complete examinations set by the Royal College of Dentists of Canada for a specialty certificate.

Dentists should have a high degree of manual dexterity, good visual memory, excellent judgement of space and shape, scientific and mathematical ability and computer skills. Knowledge and skills about application of new technologies in dentistry are also important. Interpersonal communication skills and entrepreneurial, managerial and supervisory skills are necessary in order to be successful in private practice.

Working Conditions

Dentists work in bright, clean, comfortable and specially equipped offices that are usually their own. Some dentists may work in clinical settings with physicians and other health care professionals. In this case, they may be employees or self-employed. Still other dentists work at hospitals and are employees.

Dentists wear masks, gloves and safety glasses to avoid transmission of infectious diseases, such as hepatitis. Most work four or five days a week, about 40 hours. They usually adjust their hours to meet patients' needs and may work evenings and Saturdays. Many continue to practise part time beyond the usual retirement age.

Like physicians, dentists belong to one of the most highly paid occupational groups in B.C. The 1995 average annual earnings for dentists were $80,100. Those who worked full time, full year, received average annual earnings of $86,400. The respective all-occupation averages in the province in 1995 were $27,900 and $39,400. Dentists who are men on average earn substantially more ($89,000) in full-time, full-year work than do dentists who are women ($71,200) in full-time, full-year work.

This is a medium-sized occupational group. In 1998 there were 2,860 dentists employed in B.C., up one-third from 1990. Like other health related occupations, such as physicians, self-employment among dentists is very common (75%). By comparison, the rate of self-employment across all occupations in B.C. is 15%. Like physicians, part-time work among dentists is not common (10%). The all-occupation rate for part-time employment in B.C. is 26%. The unemployment rate is virtually non-existent. There are several factors that explain why the unemployment rate is so low. Self-employment dominates in this occupation. Due to the education and training requirements, entry into this occupation is very restricted. In addition, health care services are constantly in demand. Demand for dental services is not affected by general economic conditions, and employment is not affected by seasonal fluctuations.

Dentists are located throughout the province, but tend to cluster in metropolitan centres. Most are located in the Lower Mainland (62%), on Vancouver Island (19%) and in the Okanagan/Kootenay area (13%).

More women have chosen this profession over the last several years. In 1991 their representation was 12%. By 1995 it was 18%, but this is still much lower than the 46% share women have in the provincial labour force. Women dentists are, on average, much younger (36) than dentists who are men (45).

The average age of dentists is 43, about the same as physicians in practice, and higher than the workforce average. The higher than average age distribution reflects the many years of training that dentists have to go through before practice.

Employment Prospects

Health care in B.C. and in Canada as a whole has gone through considerable change over the last few years, and more change is expected. Population growth, an aging population and technological advancement in diagnosis and treatment are increasing the demand for health services. According to the Canadian Occupational Projection System (COPS), employment for *dentists* is projected to grow at an annual rate of 1.2%, or slower than the all-occupation average. Approximately 730 total jobs will become available in B.C. between 1998 and 2008. Of these, projections indicate that 49% or 360 will be the result of retirements.

The growth in new dental jobs is driven by a number of factors. Population growth in B.C., especially the large number of aging baby boomers, means there will be more people requiring dental care. The aging of the population in Canada will result in a greater need for adult dental services, including diagnostic, preventive, operative, fixed prosthodontics, endodontics, implants and orthodontic services. More people realize the importance of keeping their teeth longer. The general increase in the income of many families has made preventive dental care increasingly affordable, and this may continue in the future. Dentists can also create demand for their services through publicizing the benefits of dental care. In addition, there is increasing demand for cosmetic dentistry.

A couple of key factors will have a negative impact on the employment demand for dentists. Industry sources indicate that opportunities for and numbers of dentists have grown faster than population growth during the past several years, with both economic recovery and use of dental insurance providing the money for dental care. This means that there is now a good supply of dentists practising in B.C.

According to industry sources, employers are withdrawing their sponsorship of dental plans and are seeking to reduce the cost of providing care. These plans are cutting the fees dentists are paid for their services, which reduces dentists' ability to provide quality oral health care to patients. The focus has shifted toward controlling costs rather than allowing dentists to provide the level of dental care that they consider appropriate for their patients.

Preventive care practices will reduce corrective care requirements as people age, compared to the needs of past generations. The emphasis has shifted from corrective care, which requires the skills of a dentist, to preventive care. Routine preventive care services can often be met with the skills of a dental hygienist (in NOC 3222 Dental Hygienists and Dental Therapists). As dentists' practices expand, they are likely to hire more dental hygienists and dental assistants. If dental hygienists continue to provide most of the preventive care, the demand for dentists may not grow as rapidly as the demand for dental services. However, dentists can also do hygienists' work, as many are already doing.

Improvements in dental technology will continue to improve preventive measures in dental care and will also provide more effective and less painful treatments for patients. The baby boom generation has benefited from good preventive dental care, such as regular brushing, flossing and the use of fluoride toothpaste. Younger generations will continue to need preventive check-ups despite such treatments as fluoridation of the water supply, which decreases the incidence of tooth decay.

The amount of work available in B.C. for recent graduates who are establishing practices will be affected by the workload and retirements of dentists working in the same geographic area. More opportunities may exist in rural areas, as some urban centres are experiencing a surplus of dental practices, resulting in increased competition for patients.

Additional Information

College of Dental Surgeons of B.C. http://www.cdsbc.org

Canadian Dental Association
http://www.cda-adc.ca/public/index.html

Related Occupations

- dental assistants (3411)
- dental hygienists and dental therapists (3222)
- dental technicians and laboratory bench workers (3220)
- denturists (3221)

Veterinarians

NOC 3114

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	500	710	910

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
200	100	300

Annual Growth 1998-2008 2.5%

Main Industries of Employment

Agriculture	94%
Federal Administration	3%
Provincial and Territorial Administration	2%

Employment by Region

Lower Mainland	51%
Vancouver Island	20%
Northern B.C.	5%
Okanagan/Kootenay	22%

Self-employment 58%

Nature of the Work

Veterinarians care for pets, livestock and sporting and laboratory animals and help to protect humans from diseases carried by animals. They diagnose animals' medical problems, dress wounds, set broken bones, perform surgery, prescribe and administer drugs and inoculate animals against diseases. They also advise owners on general care of animals to ensure health and safety.

Veterinarians are a very small occupational group. Most veterinarians work in private practice in animal hospitals and clinics. Other veterinarians are employees in governments, the food processing industry, or educational institutions. They may work in offices and laboratories or on farms.

Main Duties

In private practice, what *veterinarians* do varies with the type of veterinary specialty and location. Some veterinarians are general practitioners who treat a wide range of animals. There is a growing trend for veterinarians to specialize in treating one group of animals, for example, large animals, such as dairy cattle and horses, or small animals, such as domestic cats and dogs.

In urban areas small animal practice is common. Veterinarians treat family pets, such as dogs, cats and birds. They also stress the use of preventive medicines and advise owners of breeding, nutrition and vaccination procedures. They may also educate the public about the potential of disease that can be spread from animals to humans.

In farming and rural communities veterinarians mostly work with large animals. The traditional small farm with a mix of animals, such as cattle, pigs, sheep and chickens, has largely been replaced by operations that specialize in one type of animal. Often animals requiring veterinary services are brought from farms to large, well-equipped standing clinics. Veterinarians also drive mobile clinic vans to visit farms in order to help prevent health problems and deal directly with less severe problems.

Veterinarians in private practice also need to have business and financial skills to run a small business. They may also hire and supervise animal health technologists and technicians if necessary.

Some veterinarians work in government agencies, supervising meat inspection at packing plants and conducting research on contagious and infectious animal diseases. They also work for commercial firms that produce biological or pharmaceutical products, although these businesses are mainly located in central and eastern Canada.

©Stone/Vancouver

Example Titles

- small animal veterinarian
- veterinarian
- veterinary inspector
- veterinary pathologist
- veterinary physiologist
- zoo veterinarian

Education and Training

A career in veterinary medicine begins with completion of a Doctor of Veterinary Medicine (DVM) degree. Graduates are eligible to write the national board examination administered by the National Examining Board of the Canadian Veterinary Medical Association. Those who pass the national exam then successfully complete the B.C. Veterinary Medical Association examination to become a member of the Association. Once examinations are successfully completed, one can register and become licensed to practise in B.C. Practitioners are expected to complete at least 15 hours of continuing education per year to maintain their licences.

A DVM degree requires a minimum of six years of university education including two years' pre-veterinary education and four years' veterinary science training. The facilities required to administer adequate clinical education in veterinary medicine are extensive and costly, which has the effect of severely limiting the number of students who can be accommodated. Canadian universities and colleges graduate about 250 veterinary students per year.

Four universities in Canada have programs leading to a DVM degree. These programs are located at the University of Saskatchewan, University of Guelph (Ontario), University of Montreal (instruction in French) and the University of Prince Edward Island.

The four-year program at the Western College of Veterinary Medicine at the University of Saskatchewan serves the four western provinces. Minimum admission prerequisites to the four-year program include two full years of university in the College of Arts and Science or Agriculture with specific courses that emphasize biological science, chemistry and physics (the majority of successful applicants have undergraduate degrees). All applicants must have a minimum cumulative average of 70% to be considered for admission. Students are advised to follow a program of study that satisfies the requirements for a Bachelor of Science in Agriculture degree, as well as veterinary program entry requirements, as the competition for admission to the Veterinary program is severe. Experience in part-time or summer jobs working with animals is useful.

A two-year program in pre-veterinary medicine, which feeds into the program at Western College, is available at the University of British Columbia through the Faculty of Agricultural Sciences and the Faculty of Science. University College of the Cariboo offers a two-year Animal Health Technology program in preparation for veterinary medicine. University transfer courses are available at the various B.C. universities and many B.C. colleges and university colleges. Before enrolling, students should ensure that courses are transferable to the appropriate veterinary science program.

Postgraduate studies may be required for employment in veterinary research and education. Graduate work beyond the DVM is not always necessary but enhances a veterinarian's chances of employment in teaching, research and specialty practice.

Veterinarians must have an aptitude for science and mathematics, a capacity for hard work and long hours, managerial and supervisory skills, an understanding and love of animals, good interpersonal communication skills and a willingness to remain up-to-date on new technology in relation to the field. Entrepreneurial skills, such as business and marketing training, are important for those in private practice.

Working Conditions

Veterinarians in small animal practices work in clean and well-lit offices. In many cases they own the clinic where they work, or they may work as employees or in a partnership in a clinic. Sometimes these facilities can be noisy. Veterinarians usually work 40 to 50 hours per week, and they often adjust their hours to the clients' needs, which may include work on weekends or in the evening.

Veterinarians in large animal practices spend a substantial amount of time outdoors in all kinds of weather. They may drive well-equipped mobile clinic vans for long distances to visit farms and ranches to treat sick animals or make regular calls. Quite often they work more than 50 hours a week and are required to work nights and weekends to answer emergency calls. Veterinarians may be exposed to infectious diseases and are in danger of being kicked, bitten and scratched by animals.

The average earnings for all veterinarians in B.C. were $53,800 in 1995. Among those professional occupations dealing with health diagnosing and treating, veterinarians have the highest share working full time, full year (65%). These veterinarians earned an average of $53,600, lower than most other health diagnosing and treating professionals' earnings. The respective all-occupation averages in the province in 1995 were $27,900 and $39,400.

Earnings depend on experience and location. Industry sources indicate that for a veterinarian at entry level, earnings range between $35,000 and $45,000 a year. For an experienced veterinarian, especially in private practice, earnings can be much higher.

This is a very small occupation in B.C. There were 710 workers in 1998, up from 500 in 1990. It should be noted that industry estimates show 735 veterinarians working in all active practice categories in 1999. However, industry sources also believe that fewer veterinarians are choosing to settle in British Columbia due to what are described as "poor economic indicators."

Like other health diagnosing and treating occupations, self-employment predominates in veterinary services (58%). By comparison, the rate of self-employment across all occupations in B.C. is 15%. Part-time employment is about 8%, which is much lower than the B.C. all-occupation average of 26%. The unemployment rate for this group is virtually non-existent. Industry sources suggest that part-time employment is increasing, probably because more veterinarians prefer the flexibility of part-time work.

Veterinarians mainly work in what is classified as agricultural services (94%). The vast majority of veterinarians operate small animal practices (80%). They are located all over the province, reflecting the general distribution of the population, although there is a lower than average representation in Northern B.C. (5%). Industry sources also suggest that there is a surplus of veterinarians in the Lower Mainland and Okanagan districts. New veterinarians tend to set up practice in areas of urban development, and industry sources stress the fact that within the last decade this profession has become highly competitive.

Women's representation in this occupation increased in the early 1980s, and by 1986 it had reached 30%. Although it was slightly lower in 1991 (women accounted for 25% of this group), by 1995 women represented 37% of the practising profession. In veterinary schools, women account for up to 70% of enrollment.

The average age of women in this occupation is about 38, while the average age of men is 45. The average age for the occupation as a whole is 42 (compared to 38 years for the B.C. all-occupation average).

Employment Prospects

According to the Canadian Occupational Projection System (COPS), employment demand for *veterinarians* is projected to grow at an annual average rate of 2.5%, much faster than the average for all occupations through to 2008. However, as this is a very small occupational group, the total number of openings in B.C. between 1998 and 2008 is forecast at about 300, or an average of only 30 openings per year. About two-thirds of this total will be new jobs created as a result of growth with the other one-third coming from replacement of those who retire.

Industry sources project a more conservative picture for employment growth in B.C. than COPS does. Although they agree with the potential number of openings resulting from replacement needs, they project only a 2% increase in the professional association's membership in the near future. Because of the poor economic outlook for the province, they suggest that substantial increase in employment will not be seen in the next two years.

Industry sources indicate that this profession has become highly competitive in B.C. because of the rapid growth in the number of practitioners over the past decade. This is especially true for those in small animal practice, which accounts for approximately 80% of the current membership. Industry sources suggest that there is currently an overconcentration of practitioners in the Lower Mainland, the Fraser Valley and the Okanagan.

The high cost of setting up a new business in veterinary medicine, as high as $500,000, is also cited by the industry sources as a potential negative factor for those entering this profession. Most new graduates, as well as those experienced veterinarians entering the B.C. labour market, work as employees for several years before forming partnerships or starting new practices.

In the long run, positive factors affecting employment growth for this occupation include increasing awareness on the part of pet owners of the availability of advanced care, technological and medical advancement offering better care to animals, and the general trend of pet owners spending more on animal care. New graduates willing to handle large animals or willing to work in rural and isolated areas will have a better chance of finding employment, as there will continue to be an emphasis on scientific methods of breeding and raising livestock and poultry.

A small number of veterinarians also work for government in public health and disease control research. The duties of research-performing veterinarians are similar to those of some biologists, and new graduates from veterinary programs may consider research as an alternative career path.

Additional Information

Western College of Veterinary Medicine
http://www.usask.ca/wcvm

B.C. Veterinary Medical Association *http://www.bcvma.org/*

Related Occupations

- animal health technologists (in 321 medical technologists and technicians)
- biologists and related scientists (2121)

Optometrists

NOC 3121

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	210	320	380

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
60	20	80

Annual Growth 1998-2008 1.7%

Main Industries of Employment

Physicians, and Health Practitioners and Medical Labs	89%
Retail Trade	12%

Employment by Region

Lower Mainland	47%
Vancouver Island	23%
Northern B.C.	6%
Okanagan/Kootenay	22%

Self-employment 77%

Nature of the Work

Optometrists provide public health services in vision care. They examine eyes to diagnose vision problems and ocular disease (disease pertaining to the eye). They prescribe and fit eyeglasses and contact lenses and recommend treatments, such as exercises to correct vision problems or ocular disorders. They work in private practice, in clinics and community health centres.

Optometrists should not be confused with ophthalmologists or dispensing opticians. Ophthalmologists are physicians who diagnose eye diseases and injuries and treat problems with surgery or drugs. Like optometrists, they also examine eyes and can prescribe eyeglasses and contact lenses. Dispensing opticians fit and adjust eyeglasses and may fit contact lenses according to prescriptions written by ophthalmologists or optometrists.

Main Duties

Optometrists examine patients' eyes, conduct tests and use a variety of equipment, such as ophthalmoscopes, biomicroscopes and other specialized instruments, to determine visual efficiency. They prescribe corrective eyewear treatment (excluding drugs or surgery) to conserve, improve and correct vision and other ocular disorders. They refer patients to ophthalmologists or other physicians and surgeons when ocular or other diseases are found.

Optometrists prescribe and fit eyeglasses and contact lenses and counsel patients on contact lens use and care, visual hygiene, lighting arrangements, working distances and safety factors.

If lenses are prescribed, the optometrist usually has an assistant select and adjust frames that suit the patient. Few practitioners carry out interpretation of visual examinations only. Most prefer to supply the materials used in their own prescription in order to give a complete visual service and ensure satisfactory results. The ophthalmic materials themselves, that is, glasses or contact lenses, are generally produced by optical laboratories.

Some patients require vision training or eye exercises rather than lenses. This branch of vision care is called orthoptics. This is particularly useful for children with binocular problems. Some optometrists specialize in this field.

Fitting contact lenses is an important aspect of optometrists' work, and some may specialize in this. Still another specialization concerns the fitting of special lenses for patients whose vision cannot be corrected by ordinary spectacle lenses. Such patients may require the use of telescopic spectacles, special magnifiers, closed-circuit TV or non-optical aides.

Optometrists must pay attention to the mental and physical state of people whose eyes give them difficulty. New techniques developed to analyse and correct ocular anomalies make it necessary for optometrists to keep abreast of new developments in the profession. The mental and manual work involved in the profession gives variety to daily tasks.

Most optometrists are private practitioners who also handle the business aspects of running an office, such as developing a patient base, hiring employees, keeping records and ordering equipment and supplies.

©Stone/Vancouver

Example Titles

- optometrist
- doctor of optometry (OD)

Education and Training

In order to practise as an *optometrist* in B.C. completion of a Doctor of Optometry (OD) degree is necessary. The total university training period is at least six years in duration, including two years of university science followed by four years in a professional optometric program (including 12 months of practical clinical training). Optometrists in B.C. must pass a provincial board examination and be registered with the Board of Examiners in Optometry of B.C.

In Canada there are only two schools that offer an OD. They are the University of Waterloo in Ontario (instruction in English) and the University of Montreal in Quebec (instruction in French). B.C. has an interprovincial agreement with the University of Waterloo to train as many as five B.C. students in their optometry program each year. Competition for admission into optometry programs is keen as clinical facilities can only accommodate a portion of those who apply.

The two years of prerequisite pre-professional training should include university courses in biology, zoology, physics, chemistry, calculus and introductory psychology. In addition, students applying to the program at the University of Waterloo have to complete successfully the Optometry Admission Test (OAT) and achieve an overall university science average of at least 75%. It is important to note that students who successfully complete the pre-professional program are not guaranteed admission to the first professional year.

The Waterloo School of Optometry also offers graduate programs beyond the OD degree and residency programs in specialty areas. Occupational vision, sports vision and vision therapy are areas of optometric specialization. The residency program is a two-year program designed for individuals with an OD degree who wish to train as clinical educators and researchers. Residency programs are available in various areas, including binocular vision and aniseikonia, contact lens practice, electrodiagnostics, primary care, geriatrics, low vision, ocular health and disease, and pediatrics.

People contemplating a career in optometry should value being in contact with people and helping others. They should be emotionally stable, have manual dexterity, be able to work with a high degree of precision and attention to detail and show initiative. Photography and astronomy are hobbies that will give a student insight into the laws of lenses, light and refraction. To be successful in this field, optometrists need good practice management and marketing skills and must be involved in continuing education in all areas of practice (but especially in the treatment of eye diseases).

Working Conditions

Optometrists work in offices that are clean, well-lit and comfortable. Often the office they work in is their own, reflecting the fact that a majority are self-employed. Optometrists may also work in a clinical setting with physicians, dentists and other health care providers, in which case they may be an employee or self-employed. The trend toward group practice is increasing and helps to provide better coverage of patients during holidays and vacation periods.

Most full-time optometrists work about 40 hours a week, but a substantial number work more than 50 hours a week. Many in group practices rotate their time to work Saturdays and evenings to suit the needs of patients, but emergency calls are rare.

The average earnings for this profession in 1995 were $44,900. Among those who worked full time over the entire year (59%), the average earnings were $48,500. The respective all-occupation averages in the province in 1995 were $27,900 and $39,400. Salary statistics for 1995 showed that men earned substantially more for full-time, full-year work ($58,700) than women ($38,000). Industry sources believe that men and women earn the same salaries for the same work, due to the fact that eye examinations are billed to and paid by the B.C. Medical Services Plan. One reason for the different outcomes in annual earnings may be that more men are owner-operators and that they generate additional income based on other services and sales.

Incomes vary depending upon location, specialization and other factors. For example, industry sources indicate that for an optometrist at the entry level, the monthly salary ranges from $4,000 to $6,000 for full-time work. An experienced optometrist can earn substantially more. According to industry sources, experienced workers may earn between $8,000 and $16,000 a month. It should be noted that these salary figures from industry sources include owner-operator earnings, out of which overhead and employee salaries must be paid. Industry sources suggest that overhead and other expenses average between 40% to 60% of monthly revenues.

Salaried optometrists tend to earn more initially than those who set up their own independent practice. However, by the end of their fifth year in practice, those in private practice generally earn more.

This is a very small occupational group, with 320 people employed in 1998, up from 210 in 1990. A majority of optometrists are self-employed (77%). This is in contrast to only 15% average self-employment for all occupations. A slightly lower proportion of optometrists work part time (24%), compared to all occupations (26%). This trend of part-time work and employment on a contract basis is expected to increase in the future. According to industry sources, established optometrists cannot always offer full-time work to entry-level workers, instead, they create half-time or part-time opportunities for employment.

Unemployment in this profession is much lower than the all-occupation average and reflects generally steady demand for optometry health services. Employment is generally not affected by business conditions or seasons.

Workers in this occupation tend to cluster in urban areas. Victoria has 21% of all workers in this occupation, which is significantly higher than the total workforce average of 9%. Optometrists are also located in the Lower Mainland (47%), and in the Okanagan-Kootenay region (22%), while Northern B.C. is somewhat underrepresented with only 6% of these workers.

About 41% of optometrists are women, a share of jobs that is close to the all-occupation average of 46%. In addition, about half the optometry students today are women, which means that the proportion of women working in this field should continue to increase in the future.

The average age (44) of those in this occupation is much higher than the provincial average (38). However, men in this occupation tend to be significantly older (48) than women (37). This occupation also has a large share of workers (15%) who practise beyond the usual retirement age, compared to the all-occupation average of about 2%.

Employment Prospects

Employment growth for optometrists is projected to grow at an average rate of 1.7% per year, about as fast as the average for all occupations in B.C. through to 2008, according to the Canadian Occupational Projections System (COPS). This is a very small occupational group, and the total number of job openings between 1998 and 2008 is estimated at only 80, or an average of eight openings per year. Approximately three-quarters of the total are expected to be due to economic growth, with the remaining one-quarter replacing those who retire.

There are few openings due to turnover as this is a very stable profession. There will be a few openings to replace those who decide to return to school or leave to raise children, but very few of these professionals transfer to other occupations.

Industry sources provide a more optimistic employment outlook for optometrists in the province than the COPS does. They estimate that employment growth will be at an average rate of 3.0% per year through to 2008, and this is based on the growth of the occupation in B.C. over the past decade. They suggest that this level of growth is likely to continue into the foreseeable future primarily in response to an aging population. They also cite greater labour mobility as a positive factor underlying the continuing growth of the occupation. According to industry sources, about 180 openings are expected between 1998 and 2008. Approximately equal portions of these openings will arise from replacement needs and from new demand.

Industry sources indicate that they currently face a shortage of two or three optometrists across the province every year. On the other hand, they stress that these may not always be full-time positions, as even established practices usually offer part-time positions.

The positive employment growth rate reflects both population growth and the growing vision care needs of an aging population. The maturing of the baby boom generation and the rapid growth of the elderly population will be the main driving forces for employment growth. Those over 45 years of age visit optometrists and ophthalmologists more often because of the onset of vision problems in middle age and the increased likelihood of cataracts, glaucoma, diabetes and hypertension.

Optometrists promote early detection and treatment of vision problems for children of school ages, participate in industrial safety prevention programs and take other initiatives, all of which have increased the awareness of the importance of vision care. This in turn will increase the demand for services of optometrists.

Technological developments will probably act to limit somewhat the growth in employment for optometrists. It is anticipated that productivity gains will occur in the profession through the use of new types of equipment and instruments. This will allow each optometrist to see more patients while providing the same level of vision care and will therefore limit employment growth. Laser eye surgery to correct short-sightedness may reduce the need for corrective lenses for some people. They will still need to have regular vision assessments and, as they reach middle age, to have corrective lenses for reading.

Additional Information

Canadian Association of Optometrists http://www.opto.ca

B.C. Association of Optometrists
http://www.optometrists.bc.ca/

Related Occupations

- ophthalmologist (in 3111 specialist physicians)
- orthoptist (in 3123 other professional occupations in health diagnosing and treating)
- opticians (3231)

Industry sources indicate that they currently face a shortage of two or three optometrists across the province every year. On the other hand, they stress that these may not always be full-time positions, as even established practices usually offer part-time positions.

Chiropractors

NOC 3122

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	490	640	730

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
90	50	140

Annual Growth 1998-2008	1.3%

Main Industry of Employment

Physicians, and Health Practitioners and Medical Labs	100%

Employment by Region

Lower Mainland	54%
Vancouver Island	15%
Northern B.C.	8%
Okanagan/Kootenay	21%

Self-employment	87%

Nature of the Work

Chiropractors diagnose and treat patients whose health problems are associated with the body's muscular, nervous and skeletal systems, especially the spine. Interference with these systems is believed to impair normal functions and lower resistance to disease. Chiropractors believe that misalignment of spinal vertebrae or irritation of the spinal nerves can change many important body functions.

The chiropractic approach to health care stresses the patients' overall well-being, including factors such as proper exercise, diet, rest, environment and heredity. They use natural, drugless and non-surgical treatment methods, relying mainly on the body's inherent healing abilities.

©Stone/Vancouver

Main Duties

Like other health diagnosing and treating professionals, *chiropractors* follow a standard routine to obtain information necessary for treatment. They take patients' case histories, observe patients and perform or order X-rays and other tests to diagnose patients' conditions. X-rays are an important diagnostic tool.

In cases where a problem is found in the musculoskeletal structures, chiropractors manually manipulate or adjust the spinal column. They may also use water, light, massage, ultrasound, electric and heat therapy and may apply support, such as straps, tapes and braces.

Chiropractors advise patients on nutrition, diet and ways to deal with stress. When necessary, chiropractors may refer patients to other health practitioners.

Most chiropractors are general practitioners. Some specialize in athletic injuries, occupational and industrial health, neurology or orthopedic disorders. Some specialize in taking and interpreting X-rays.

Most chiropractors have a solo private practice. In this case, a chiropractor has to look after the finance and administration of a small business as well as development of a client base.

Example Titles

- chiropractic doctor
- chiropractor
- doctor of chiropractic (DC)

Education and Training

In order to obtain a licence to practise as a chiropractor in B.C., one must graduate from an accredited chiropractic college and receive a Doctor of Chiropractic (DC) diploma or degree and then pass a national examination set by the Canadian Chiropractic Examining Board as well as a provincial entrance examination to qualify for registration with the British Columbia College of Chiropractors. Continuing professional education is required in order to maintain registration.

The only English educational institute in Canada offering a chiropractic program of study is the Canadian Memorial Chiropractic College in Toronto, Ontario. However, most chiropractic colleges in the United States also are recognized by the B.C. College of Chiropractors. A nearby college is located in Portland, Oregon (Western States Chiropractic College).

The minimum academic requirement for the four-year program at the Canadian Memorial Chiropractic College is three full years of university. At least a "B" average is required, although an average closer to a "B+" is recommended. Many students enter the program with a bachelor's degree in science or arts. Admission to the Chiropractic College is based on the factors of grade-point average, three letters of reference, essay, autobiographical submission and interview. Students who are offered admission to the College must submit, at the time of registration, a signed health status report by a health practitioner and results of a tuberculin and/or chest X-ray. Prerequisites are subject to change, therefore it is advisable to contact the College in Toronto for exact requirements.

Chiropractors are often in contact with people who are in pain, therefore they must be empathetic, compassionate, patient and effective communicators. Physical strength, good eyesight and hearing, and a high degree of manual dexterity and perseverance are also required in this work.

Working Conditions

Chiropractors work in clean and comfortable offices that are usually their own or in group clinics where a few chiropractors or other regulated health professionals share the equipment. Sometimes in rural areas chiropractors visit patients in their homes to give treatment, or they may attend at hospitals or other institutional settings.

X-rays are an important diagnostic tool, and most offices are equipped with X-ray equipment. However, chiropractors potentially can be exposed to the hazards of X-rays if the equipment is not used properly or not enough protection is applied. Chiropractors could also face spinal injuries or contagious diseases when treating patients.

Chiropractors generally work 40 hours a week. They can set their hours, but they usually adjust their hours to meet patients' needs, including availability on evenings and weekends. Group practice has the advantage of continuing chiropractic services when chiropractors take turns for holidays.

Chiropractors' average earnings in B.C. were about $53,300 in 1995. Like others in health diagnosis and treatment, many chiropractors work full time, full year (60%). These chiropractors' earnings averaged $54,600. Earnings vary with the number of hours worked, the number of years in practice, location and other factors. Presently chiropractors' income is on a fee-for-service basis and is covered under the Medical Services Plan of B.C. up to a certain limit. This may be affected in the future, depending on the degree to which the provincial government pays for chiropractic services. According to industry sources, 70% of fees currently come from patients.

Chiropractors are a very small occupational group. Employment in B.C. was 640 in 1998, up from 490 in 1990. This suggests a steady demand for chiropractic services and employment demand for chiropractors. Self-employment in the profession is the highest among all health diagnosing and treating occupations (87%). Part-time work among chiropractors is 14%, and unemployment is lower than the average for all occupations. This occupation generally is not affected by the ups and downs of the economy nor by seasons.

Chiropractors are located all over the province, generally reflecting the distribution of the population. As the population is concentrated in the Lower Mainland and on Vancouver Island, so is the distribution of chiropractors (54% and 15% respectively). In the Okanagan/Kootenay region the percentage of chiropractors is higher (21%) than the general population distribution for that region of B.C.

Women account for 18% of chiropractors, compared to their 46% share of the B.C. workforce. As well, the representation of women among chiropractors is much lower than it is among other health diagnosing and treating occupations, such as general practitioners (28%), specialist physicians (26%) or optometrists (41%). The average age of chiropractors is 42, and many chiropractors (7%) continue to practise after the usual retirement age.

Employment Prospects

Employment growth for *chiropractors* is projected to be at an average rate of 1.3% per year, slower than the average for all occupations in B.C. through to 2008, according to the Canadian Occupational Projections System (COPS). This is a very small occupational group, and the total number of job openings between 1998 and 2008 is estimated at 140, or an average of 14 openings per year. Close to two-thirds of the total will be due to economic growth, with the remaining one-third being the result of retirements.

Industry sources suggest a more optimistic employment growth rate for chiropractors in B.C. than COPS does. Their consensus is that between 1998 and 2008 there will be approximately 180 openings available, or an average of 18 per year. Approximately two-thirds of the openings are expected to result from growth in population with the remaining one-third resulting from retirements.

Several factors support a slightly more positive outlook than that provided by the COPS projections.

Population growth, especially among the elderly, will increase the demand for health care in general. Health problems relating to spine function and mobility tend to increase as people age.

Because chiropractic treatment emphasizes the importance of healthy lifestyles and preventive care and does not prescribe drugs or perform surgery, it is becoming more appealing to the public, who are more often seeking alternative medicine.

A factor underlying the COPS projection of modest employment growth is the continuing constraint on the provincial government budget. This may limit growth in funding allocated to some health care services, including chiropractic services. On the other hand, 75% of the total number of chiropractors currently operate on a direct fee-for-service basis, which suggests that patients want chiropractic services and are willing to pay directly or through extended health insurance plans. Employment of chiropractors may therefore not be as affected by government constraints as that of other health practitioners.

Industry sources indicate that currently there is an ample supply of chiropractors across the province, and they do not believe that there is a shortage in any particular region. However, they do not believe that there is as yet a surplus of these professionals in the province, and this suggests that there may still be room for those new to the occupation.

This may be true particularly for those professionals willing to practise in rural and remote areas.

Women practitioners may also find strong demand for their services, especially among women and children. This is because there are still relatively few women in this occupation, and women and children may prefer to see a woman chiropractor.

A growing number of new graduates are joining existing practices and working as associates when they first start their careers in chiropractic services. In this way, they are able to gain experience and earn enough money to invest in equipment for their own private practices.

Individuals considering this profession are advised to consult local sources for up-to-date information on chiropractic services and employment opportunities before making career and training decisions.

Additional Information

B.C. College of Chiropractors http://www.bcchiro.com/bccc

Canadian Chiropractic Association http://www.ccachiro.org

Related Occupations

- chiropractic aide (in 6631 elemental medical and hospital assistants)
- massage therapist (in 3235 other technical occupations in therapy and assessment)
- physiotherapist (in 314 therapy and assessment professionals)

> ***Industry sources indicate that currently there is an ample supply of chiropractors across the province, and they do not believe that there is a shortage in any particular region. However, they do not believe that there is as yet a surplus of these professionals in the province, and this suggests that there may still be room for those new to the occupation.***

Other Professional Occupations in Health Diagnosing and Treating

NOC 3123

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	160	180	230

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
50	10	60

Annual Growth 1998-2008 2.5%

Main Industries of Employment

Physicians, and Health Practitioners and Medical Labs	80%
Hospitals	11%
Other Manufacturing	6%

Employment by Region

Lower Mainland	46%
Vancouver Island	38%
Northern B.C.	0%
Okanagan/Kootenay	19%

Self-employment 78%

Nature of the Work

This occupational group includes *podiatrists* (also called *chiropodists*), *naturopaths, orthoptists* and *osteopaths*. They are health professionals who diagnose and treat the diseases and injuries of patients and who are not elsewhere classified. Podiatrists, naturopaths and osteopaths work in private practices, while orthoptists work in clinics and hospitals.

Main Duties

Podiatrists diagnose diseases, deformities and injuries of the human foot and treat patients using braces, casts, shields, splints, physical therapy, medications or surgery.

Naturopaths diagnose patients' diseases and disorders. They employ natural methods of healing, such as acupuncture, acupressure and spinal manipulation, in their treatment. They also may use reflexology, hydrotherapy, herbal medicines, biochemical therapy, nutritional therapy, homeopathy and psychological therapy in their treatment.

Orthoptists assist ophthalmologists in the diagnosis and treatment of eye disorders. They perform specialized eye tests to measure and assess defective binocular vision or abnormal eye movement in patients. They educate patients about proper visual habits and prescribe treatment, such as eye exercises or other visual training.

Osteopaths diagnose disorders and injuries of the musculo-skeletal, circulatory and nervous systems and treat patients with manipulative therapy, medications or surgery.

Most podiatrists, naturopaths and osteopaths set up their own private practices. Therefore, besides diagnosis and treatment responsibilities, they also have to take care of running a small business. This includes having to look after finance and administration, as well as developing a client base.

Example Titles

- chiropodist
- foot specialist
- naturopath
- orthoptist
- osteopath
- podiatrist

Education and Training

A Doctor of Podiatric Medicine (DPM) degree is needed in order to practise as a *podiatrist*. Podiatric medicine programs are four years in duration, followed by a one- to three-year internship (depending on the specialty). Graduates are eligible to write the examination conducted by the B.C. Association of Podiatrists and, if successful, may obtain a licence to practise podiatry in B.C. Practising podiatrists are required to take at least 30 hours of continuing education per year to maintain their licence.

At present there are no colleges of podiatry in Canada. Several American colleges provide the four-year program leading to the Doctor of Podiatric Medicine (DPM) degree. The program geographically closest to British Columbia is offered by the California College of Podiatric Medicine in San Francisco. The minimum academic entrance requirement for all programs of podiatry is three years at a recognized college or university. However, in most cases a bachelor's degree or advanced degree is needed to be considered for admission. Entering students often have a 3.0 GPA, in the sciences and also cumulatively. All international applicants (including Canadian citizens) are required to have their academic credentials evaluated by the World Education Services, Inc.

Since podiatry is a health care service, those considering this occupation should have a natural interest in helping people as well as manual dexterity, good eyesight and an interest in science.

A degree in naturopathic medicine and successful completion of provincial examinations administered by the British Columbia Naturopathic Association are necessary in order to practise as a *naturopath* in B.C. Training takes a minimum of seven years, including three years in a basic university science program (undergraduate degree is strongly recommended) followed by four years of professional training in naturopathic medicine. Most colleges and universities in B.C. provide the required prerequisite science courses.

There are five schools of naturopathic medicine in North America, two of which are in Canada. The West Coast College of Massage Therapy, in affiliation with the West Coast Naturopathic Medical College, offers a four-year diploma in naturopathic medicine. The Canadian College of Naturopathic Medicine in North York, Ontario offers a four-year professional naturopathic medical program and a two-year accelerated program. The National College of Naturopathic Medicine in Portland, Oregon, Bastyr College in Seattle, Washington, and the Southwest College of Naturopathic Medicine and Health Sciences in Tempe, Arizona offer four-year professional programs. These institutions should be consulted prior to application to ensure that entrance requirements have been met.

Naturopathic practice includes seven major disciplines. Each of these is a distinct area of practice and includes diagnostic principles as well as therapeutic skills and techniques. These include *acupuncture* and *Oriental medicine*, *botanical medicine*, *clinical nutrition*, *homeopathic medicine*, *hydrotherapy*, *naturopathic manipulative therapy* and *lifestyle* and *psychological counselling*. Prospective naturopathic practitioners should be emotionally stable, tolerant, empathetic, patient, able to solve problems and think creatively and analytically. Naturopathy is more than just a health practice. It is a philosophy and a lifestyle. Prospective naturopathic practitioners should value natural health practices, enjoy working with a variety of people and believe in the body's ability to heal and thrive.

A Doctor of Osteopathy degree is necessary in order to practise as an *osteopath* in B.C., as well as registration with the College of Physicians and Surgeons of B.C., which usually follows an internship of at least one year.

The Canadian College of Osteopathy is the only osteopathy college in Canada. However, it is not yet accredited, as Canada does not have a Canadian Association to regulate the practice. The U.S. has several accredited colleges of osteopathy. A minimum of three years of college or university (undergraduate degree is preferred) including courses in science and English, and successful completion of the Medical College Admissions Test (MCAT) are usually required for entrance into an osteopathic college. British Columbia colleges, college universities and universities offer courses and degrees in these subjects. Students are advised to consult the college of their choice as early as possible to find out the current academic requirements for admission.

Students who are planning to become *osteopaths* must have above average scholastic ability and be emotionally stable, able to meet and talk with people easily and tolerant of various values and approaches to life.

Orthoptists must complete at least two years of post secondary education in science, a two-year hospital-based training program in orthoptics and supervised practical training. Certification with the Canadian Orthoptic Council is recommended and involves practical, oral and written examinations.

An intensive, 24 consecutive month orthoptic training program is offered by the Orthoptic Clinic at the B.C. Children's Hospital in Vancouver. Two students are accepted into the program every second year. Admission requires a bachelor's degree with an emphasis on the sciences. Recent students have taken courses in physics, biology, mathematics and statistics. Courses in social science may also be beneficial. Graduates must write the examination administered by the Canadian Orthoptic Council to become certified. Once certified, graduates can work anywhere in Canada. (Inquiries about this program should be directed to Geraldine Tillson at (604) 875-2111.) Currently there is no regulatory body for orthoptists, and licences are not required in order to practise.

People contemplating a career in orthoptics should value being in contact with people and helping others. They should be emotionally stable, have manual dexterity, be able to work with a high degree of precision and attention to detail and show initiative. Orthoptists should be analytical and patient, with good verbal and written communication skills. They should be comfortable with young people since many orthoptic patients are children. An interest in continuing education is necessary in order to be successful.

Working Conditions

Although the type of patients or problems they encounter may be quite different, *podiatrists, naturopaths* or *osteopaths* work in well-lit, clean offices that are usually their own. Sometimes they have to travel to make hospital or house calls. *Orthoptists* work in clinic or hospital settings.

Workers in this group usually work 40 hours per week and can set their own hours. However, most of the time they adjust their hours to meet the needs of patients and sometimes work evenings and weekends. Some of them work in group clinic settings, which allows for planned vacations and sharing of work.

On average, professionals in this group in B.C. earned $41,700 in 1995. Full-time, full-year professionals earned an average of $67,300. The respective all-occupation averages in the province in 1995 were $27,900 and $39,400. Earnings generally vary depending on the number of hours worked, the number of years in practice, the number of established clients, location and other factors.

Although this is a very diverse group, overall it is still very small in size. Employment in B.C. was 180 in 1998, up from 160 in 1990. Podiatrists and naturopaths are two major groups within this classification.

Just like other professionals in health diagnosis and treatment, the majority in this group is self-employed (78%), although orthoptists are more likely to work as employees at hospitals and ophthalmologists' offices. By comparison, the rate of self-employment across all occupations in B.C. is 15%. The unemployment rate is essentially non-existent. However, unlike other professionals in diagnosis and treatment, a higher percentage of professionals in this group work part time (39%), higher than the B.C. all-occupation average of 26%. The work is only mildly sensitive to economic ups and downs and is not affected by seasonal fluctuations.

Professionals in this group mainly work in the offices of health practitioners (80%), such as osteopaths, naturopaths and podiatrists. Almost all of them are located in the Lower Mainland (46%) and on Vancouver Island (39%). According to data available at the time of publication, none of these professionals practised in Northern B.C.

Unlike other health diagnosis and treatment professionals, such as physicians, professionals in this group have a much higher proportion of women (46%). The average age of professionals in this group is 44, similar to other health diagnosis and treatment professionals.

Employment Prospects

Employment for professionals in this occupational group is projected to grow at an average rate of 2.5% per year, much faster than the average for all occupations in B.C. through to 2008, according to the Canadian Occupational Projections System (COPS). This is a very small occupational group, and the total number of job openings between 1998 and 2008 is estimated at only 60, or an average of 6 openings per year. Close to five-sixths of the total are expected to be due to population and economic growth, and the remaining one-sixth will be the result of retirements.

The expectation of continuing and increasing demand for services of professionals in this occupational group is based on a growing and aging population. As more of the baby boom generation start reaching their later middle ages, the overall demand for various health care and treatment services is expected to increase. For example, elderly people have more years of wear and tear on their feet and legs than most younger people and are more prone to foot ailments, so they will require podiatric services. Those who pursue an active lifestyle can also be prone to foot injuries and may be more willing to seek preventive care from a *podiatrist*.

The high demand for naturopathic services reflects the growing importance of alternative primary and preventive care. Alternative ways of keeping healthy or healing are becoming more acceptable to the public, many of whom no longer rely solely on medication and surgery, which should help maintain the demand for naturopathic services and result in more employment opportunities for *naturopaths*.

Orthoptists provide very specialized treatment to both the young and the old. For example, they provide vision therapy, which is an individualized treatment program prescribed by optometrists to improve conditions such as crossed eyes or lazy eye, and to help persons with these conditions learn, relearn or reinforce specific vision skills. Vision therapy can be an effective treatment for many problems that cannot be treated with eyeglasses or contact lenses alone. In the future, demand for these specialized services should provide steady employment opportunities for orthoptists.

Most services provided by professionals in this occupational group are privately funded. Changes in public funding policies should not affect demand for these services to any great extent. On the other hand, the cost associated with setting up a private practice is quite substantial. New graduates will probably work as staff or associates for a number of years in order to gain experience and earn sufficient income to pay for start up costs.

Individuals who consider entering one of these professions are advised to consult training institutes and industry sources for up-to-date information on specific service outlook and employment opportunities before making career and training decisions.

Additional Information

For *podiatry*
Canadian Organization of Medical Physicists
http://www.medphys.ca

For international student credential evaluation
World Education Services http://www.wes.org

For *naturopathy*
Canadian College of Naturopathic Medicine
http://www.ccnm.edu

National College of Naturopathic Medicine
http://www.ncnm.edu

Southwest College of Naturopathic Medicine and Health Sciences http://www.scnm.edu

Related Occupations

- chiropractors (3122)
- general practitioners and family physicians (3112)
- midwives and practitioners of natural healing (3232)
- specialist physicians (3111)

Pharmacists

NOC 3131

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	1,640	2,500	3,050

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
550	70	620

Annual Growth 1998-2008	2.0%

Main Industries of Employment

Retail Trade	79%
Hospitals	18%
Provincial and Territorial Administration	1%

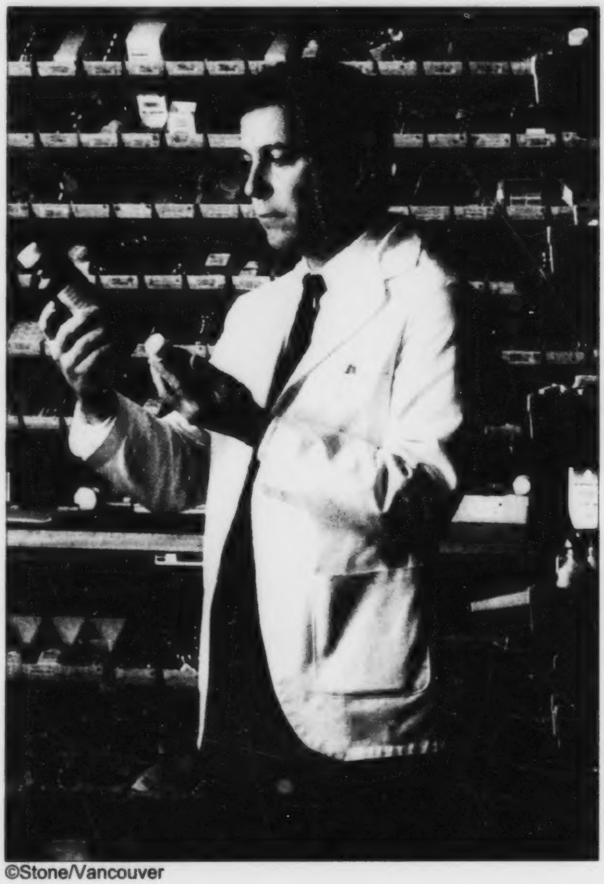
Employment by Region

Lower Mainland	63%
Vancouver Island	14%
Northern B.C.	9%
Okanagan/Kootenay	14%

Self-employment	9%

Nature of the Work

Pharmacists prepare and dispense drugs on the prescription order of a physician, dentist or veterinarian. They also provide drug information on the safe and appropriate use of drugs to the public. They advise physicians and other health practitioners on the selection, dosages and side effects of medication. Pharmacy care includes the identification, prevention and resolution of medication-related problems. Most pharmacists are in community (retail) and hospital pharmacies. Some pharmacists are employed by the pharmaceutical industry, government agencies and even the military service for the research, development and manufacturing of drugs. A few pharmacists are employed by research and education institutions.



©Stone/Vancouver

Main Duties

The largest share of *pharmacists* work in community pharmacies located in drug stores or other retail stores. Their main responsibilities are to receive, interpret and dispense a physician's prescription. They also provide non-prescription drugs. At the same time, they must educate patients on the type of drugs prescribed and answer any questions patients may have. With the extensive use of computers, pharmacists keep records of patients' drug therapies to ensure that harmful drug interactions are prevented.

Pharmacists are also responsible for the proper and safe storage of drugs. Some drugs, such as controlled narcotics, are regulated and may be dispensed only under strict conditions defined by law. Pharmacists must keep learning about new developments in technology and medication.

Many of Canada's community pharmacies are in chain stores. Some are in discount stores or supermarkets. Others are independently owned and operated by one or more pharmacists, although the independent share has declined over the past 10 years. These pharmacists have to know how to run a small business. Since they are easily accessible to the public, many pharmacies also provide services in home health care, such as self-diagnostic kits, athletic supplies or medical aids for seniors and the disabled.

Hospital pharmacists perform many duties that are similar to those of community pharmacists. However, they usually work as part of a team of professionals and are involved in choosing the optimum patient drug therapy.

Pharmacists in the pharmaceutical industry may monitor product quality control or work in research and development departments. When they have enough experience, they may work as medical service representatives or in management positions.

Example Titles

- clinical pharmacist
- community pharmacist
- druggist
- hospital pharmacist
- industrial pharmacist
- pharmacist
- retail pharmacist

Education and Training

In order to practise as a *pharmacist* in B.C. it is necessary to be registered with the College of Pharmacists of British Columbia. This requires completion of a program of study that satisfies the Pharmacists Act (which includes completion of 160 hours of supervised fieldwork in B.C.) and allows graduates to take the examinations of the Pharmacy Board of Canada. Additional assessment procedures are conducted by the College of Pharmacists of B.C., and upon satisfying these criteria, applicants are eligible to register.

The University of British Columbia (UBC) offers a four-year Bachelor of Science in Pharmacy that satisfies the academic requirements noted above. Admission prerequisites include completion of one year of university science (includes biology, chemistry, English, math and physics). Most colleges and university colleges in B.C. offer the various prerequisite courses required to gain admission into the UBC pharmacy program. Interested students should contact UBC for a current list of appropriate science courses. Enrollment to the program is competitive, and final selection is at the sole discretion of the Faculty of Pharmaceutical Sciences. Preference is given to well-qualified residents of British Columbia.

One-year residency programs in hospital pharmacy and community pharmacy, as well as continuing education courses, are also available. UBC offers a two-year, post-baccalaureate professional degree, which provides advanced training in clinical pharmacy practice and leads to a Doctor of Pharmacy (PharmD) degree. In addition, UBC offers master's and doctoral programs specializing in biopharmaceutics, clinical pharmacy, pharmaceutics, pharmaceutical chemistry, medicinal chemistry, pharmacology, toxicology, pharmacy practice and pharmacy management, for those interested in a career involving research.

Prospective pharmacists should be able to present information clearly and quickly, work with a high degree of precision and maintain accurate records. Manual dexterity, analytical and problem-solving skills and knowledge of computer applications are necessary. Pharmacists who own or manage a pharmacy must learn to manage a business and supervise staff.

Working Conditions

Pharmacists usually work in well-lit, clean and well-ventilated areas. Many pharmacists spend most of their days on their feet. When working with potentially dangerous or sterile pharmaceutical products, pharmacists wear gloves and masks and use protective equipment. Many community and hospital pharmacies are open long hours, so pharmacists may work evenings, nights, weekends and holidays. Those who consult may travel to nursing homes or other facilities.

Pharmacists generally work a 40 hour week, although some self-employed pharmacists work over 50 hours a week. Like all health care professionals, they must be alert all the time, even in stressful situations.

Pharmacists earned $42,000 on average in B.C. in 1995. A relatively high proportion of pharmacists work full time, full year (58%). These pharmacists' average earnings were $52,500. The respective all-occupation averages in the province in 1995 were $27,900 and $39,400.

There are variations in earnings among pharmacists, depending on the number of hours worked, their experience, the type of practice they work for, whether they belong to unions or not and other factors. According to a recent wage survey conducted by the B.C. Pharmacy Association, the average wage rate for B.C. pharmacists is about $27 an hour.

This is a medium-sized occupational group. Employment in 1998 in B.C. was estimated at 2,500, up from 1,640 in 1990. Only a small portion (9%) of pharmacists are self-employed compared to some other health professionals, and this figure is lower than the 15% provincial average for self-employment for all occupations. At 25%, the proportion of part-time pharmacists is almost identical to the average for all occupations in B.C. (26%), and industry sources indicate that part-time employment is likely to increase in the future because more and more workers are opting for the flexibility that part-time work allows.

The unemployment rate for pharmacists is much lower than the average for all occupations. Employment demand is only mildly sensitive to business conditions but is not sensitive to seasonal fluctuations.

Pharmacists are mainly employed in retail trade (79%) and in hospitals (18%). They are located all over the province but show a slightly greater concentration in the Lower Mainland (63%).

Women's representation in this occupation has steadily increased over the years. Between 1971 and 1986 it almost doubled and further increased from 44% in 1986 to 49% in

1991. In 1995 women represented 59% of the workers in this occupation, a figure significantly higher than the average representation of women in the workforce (46%). The average age of women in this occupation is lower (36) than that of men (43). Many young people continue to enter this occupation.

Employment Prospects

Employment of *pharmacists* is projected to grow faster than the average for all occupations in B.C. through to 2008, according to the Canadian Occupational Projections System (COPS). COPS is projecting that the strong employment growth this occupational group experienced over the past decade will continue. The total number of job openings between 1998 and 2008 is estimated at 620, or an average of 62 openings per year. The majority of the total openings, close to 90%, will be the result of increased demand due to economic growth, with the remaining 10% due to retirements.

The low proportion of openings due to retirement reflects the fact that many pharmacists move into pharmacy management before they reach retirement age. As a result, there will be many additional openings for pharmacists to replace those who move into management positions as they gain industry experience.

For example, nearly 80% of pharmacists in B.C. work in the retail industry in pharmacies and often with only a few pharmacists on staff. When a manager retires, the replacement manager is often one of the senior pharmacists. When pharmacists move into management, they become classified as retail trade managers in the National Occupational Classification system (NOC 0621 Drug Store Managers in 01/09 Middle and Other Management) even though they may still be a practising pharmacist. These openings caused by career progression are not captured by the COPS retirement model.

Industry sources agree that there will probably be more pharmacists required to replace those who move into management. They also expect that there will be more retirement openings than COPS estimates.

Industry sources agree that there will be an increasing number of employment opportunities for pharmacists over the next decade, and they think that this will be the case in rural communities particularly. They are concerned that currently there is a severe shortage of pharmacists across Canada. Although the size of graduating classes is increasing, new pharmacists in B.C. have not reported much difficulty in finding employment, even in such populated areas as the Lower Mainland.

The role of pharmacists is gradually changing. The traditional role of counting pills and making sure a prescription is properly filled is now only a small part of a pharmacist's responsibilities. With the advancement of technologies, more automatic drug dispensing mechanisms are available. Filling prescriptions by mail order or over the Internet is also increasing. In addition, more pharmacy technicians are being hired by retail operators to support pharmacists. This cost-cutting measure reduces the number of pharmacists required.

Limited growth for employment of hospital pharmacists is expected in the near future as hospitals continue to reorganize in response to limited funding growth in health care. In the future, pharmacists may find increased opportunities in long term and home care settings.

On a more positive note, many factors support the continued growth of this occupation in the near future. Pharmacists are increasingly important members in primary and preventive care. While they will continue to fulfil their traditional roles, many of them are taking up a more active role with patients or other professionals in health care by identifying, preventing and resolving medication-related problems. As pharmaceutical products become more complex, patients themselves tend to rely on pharmacists more frequently. Because of patient concerns, pharmacists now give more advice direct to the public on such health issues as potential side-effects of medications, complications from allergy reactions and medication interactions.

There is a growing emphasis on preventive health services generally, and this is affecting the role of pharmacists. The use of medication to treat diseases and conditions is often considerably less expensive than the potential costs for patients whose conditions go untreated and who may require surgery. In some cases medication may even be a substitute for surgery itself. As a result, pharmacists often find themselves working as consultants or teachers in preventive health care. Other new employment opportunities will continue to emerge for pharmacists in research, marketing and sales in the biotechnology, insurance and pharmaceutical industries.

The current national shortage of pharmacists is also a result of increased medication rates and the start up and expansion of pharmacy departments in big-box chain stores and grocery stores. As the population ages, the overall usage of medication is expected to increase. Retailers respond to this demand by offering convenient and longer pharmacy service hours. As many retail pharmacists prefer working flexible hours and a less than full-time load, there will probably be ongoing vacancies available for those new to the occupation, even though they may not always be full-time positions.

Additional Information

UBC Faculty of Pharmaceutical Sciences
http://www.ubcpharmacy.org

Canadian Pharmacists Association http://www.cdnpharm.ca/

Related Occupations

- chemist (in 211 physical science professionals)
- pharmacologist (in 2121 biologists and related scientists)
- pharmaceutical sales representative (in 6221 technical sales specialists, wholesale trade)

Dietitians and Nutritionists

NOC 3132

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	750	790	960

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
170	20	190

Annual Growth 1998-2008 2.0%

Main Industries of Employment

Hospitals	56%
Other Health and Social Services	13%
Physicians, and Health Practitioners and Medical Labs	11%

Employment by Region

Lower Mainland	64%
Vancouver Island	13%
Northern B.C.	8%
Okanagan/Kootenay	15%

Self-employment 13%

Nature of the Work

Dietitians and *nutritionists* are specialists in food and nutrition. They generally work as members of a health care team to promote and support the health of individuals and communities. In B.C., members of the B.C. Dietitians and Nutritionists Association, the professional regulatory and member services organization, are entitled to use the designations registered dietitian, registered nutritionist, or registered dietitian/nutritionist and the initials RDN. This is a very small occupation in B.C.

Dietitians and nutritionists are employed in hospitals and community care facilities, as well as in public health and educational institutions. In private practice they work with the advertising industry and the food industry and as consultants to provide consumer education on radio and television programs.

Main Duties

Many fields of specialization have developed within the dietetic profession. Among them, *clinical dietitians* and *nutritionists* provide nutritional services for patients in institutions, such as hospitals and care homes. They assess patients' nutrition needs, develop and implement nutrition programs, and evaluate and report the results.

Community nutritionists identify community needs and develop programs and services to meet these needs. They are involved in advocacy and policy development to improve access to safe, nutritious food.

Administrative or *management dietitians* and *nutritionists* oversee large-scale meal planning and preparation in health care facilities, schools or company cafeterias. They also hire, train and direct other dietitians and food service workers. Their administrative duties include managing food service operations to provide quality food, controlling operating costs, enforcing safety regulations and preparing records and reports. To become a qualified administrative or management dietitian requires management skills and many years of experience.

Research dietitians and *nutritionists* study dietary habits and research nutrient metabolism and nutritional status. Advanced graduate education is needed in order to qualify to teach or research. (In a college or university, teaching or research dietitians and nutritionists are classified under college and other vocational instructors in NOC 4131. Readers should also refer to that profile for more information.)

Example Titles

- administrative dietitian
- clinical dietitian
- community dietitian
- community nutritionist
- consultant dietitian
- research dietitian
- nutrition and dietetics researcher

Education and Training

Dietitians and *nutritionists* require at least a bachelor's degree in an accredited foods nutrition program and a supervised accredited practical training program (40 to 50 weeks) or a master's or doctoral degree. Registration is required with the B.C. Dietitians' and Nutritionists' Association (BCDNA). Since 1998 all new applicants have been required to pass the national qualifying examination.

The University of British Columbia's (UBC) Faculty of Agricultural Sciences offers two four-year degrees in the areas of dietetics and nutritional sciences. Each of these majors are within the Food, Nutrition and Health Program. Langara College and Simon Fraser University offer various nutrition and dietary related courses that may be transferable to the UBC program. Please check the B.C. Transfer Guide or speak with a counsellor to determine which courses are transferable to UBC.

A bachelor's degree in nutritional sciences is intended for those interested in graduate study and research in nutrition, as well as for those interested in agriculture or the health sciences in an area in which a background in nutrition would be helpful.

A bachelor's degree in dietetics is designed to provide preparation for students interested in pursuing careers as professional dietitians. The dietetics program involves greater attention to patient care, administration and the role of food in the prevention, etiology and treatment of disease. Graduates may apply for an accredited dietetic practicum in order to qualify for membership in national or provincial regulatory bodies. (Other students with a bachelor's degree in science, food science or home economics may undertake additional study at UBC to qualify for application to the Dietetic Internship program. However, completion of this study does not lead to a degree in dietetics and does not guarantee placement in the Internship program.) UBC also offers master's and doctoral programs in Nutritional Sciences. Admission requirements to the bachelor's programs include a strong high school background in mathematics and science.

For a review of biochemistry programs see the profile Physical Science Professionals (211).

Those interested in becoming dietitians or nutritionists should have scientific aptitude and organizational and management ability. They should communicate well, work well with people and be adaptable and flexible. They should be able to plan, administer and supervise programs. Marketing, counselling and research skills are becoming more important, as is an ability to deal with media. Because work settings are becoming more computerized, computer skills are vital. Entrepreneurial skills may be necessary in order to remain competitive in the future.

Working Conditions

The general work environment for *dietitians* or *nutritionists* depends on the type of facility in which they work. In many workplaces the hours are regular, although some dietitians' work requires that they be available to give presentations or attend meetings in the evening or on weekends. Dietitians and nutritionists do not always work in orderly and quiet surroundings, as their offices are sometimes located near kitchens where food is prepared. The work may involve a considerable amount of walking or standing. For those working in research and teaching institutions, hours may be irregular, for instance, classes are often held in the evenings.

Earnings for dietitians and nutritionists on average in B.C. were $32,200 in 1995. Full-time, full-year dietitians' and nutritionists' earnings averaged $43,400. The respective all-occupation averages in the province in 1995 were $27,900 and $39,400.

Earnings vary depending on experience and union membership, but it is possible to earn from $2,900 to $3,500 per month at the entry level. Non-union members may earn less. Industry sources believe that entry-level earnings may be slightly higher than current data suggests, with monthly earnings starting at $3,500 for full-time work.

This is a very small occupational group in B.C. Employment in 1998 was estimated at 790, up from 750 in 1990. This suggests a fairly steady demand for services from dietitians and nutritionists. Most of these workers are employees in hospitals or other health care facilities. However, self-employment is increasing (13%) and is close to the all B.C. average of 15%.

About 30% of this group work part time, which is higher than the provincial average for all occupations (26%), and part-time work is expected to increase in the future. The unemployment rate is also much lower than the provincial average. Employment demand can vary with economic ups and downs but is not seasonal.

Most dietitians and nutritionists are employed in hospitals (56%) and in other health and social services (13%), such as continuing care homes and community health centres. They also work in the offices of dietitians and/or nutritionists (11%). They are located according to the general population distribution, although there is a higher than average concentration in the Lower Mainland (64%). Many of these workers are also in the Okanagan/Kootenay region (15%) and on Vancouver Island (13%).

Women have traditionally made up the majority in this occupation (93%). However, this is also a new occupation for men. While the average age of women professionals in this occupation is 39, the average age for men is 34. Overall, the average age for the occupation is 39.

Employment Prospects

Employment of *dietitians* and *nutritionists* is projected to grow faster than the average for all occupations in B.C. through to 2008, according to the Canadian Occupational Projections System (COPS). This is a very small occupational group, and the total number of job openings between 1998 and 2008 is estimated at only 190, or an average of 20 openings per year. The majority of the total openings, close to 90%, are expected to be the result of increased demand due to population and economic growth, with the remaining 10% expected to replace those who retire from the occupation.

The low proportion of openings due to retirement reflects the fact that many dietitians and nutritritionists move into management before they reach retirement age. As a result, there will be many additional openings to replace those who move into management positions as they gain industry experience.

When dieticians and nutritionists move into management the National Occupational Classification system then classifies them as retail trade managers or managers in health care (NOC 0621 store managers or NOC 0311 managers in health care, in 01/09 Middle and Other Management), even though they may still be practising in their field. These openings caused by career progression are not captured by the COPS retirement model.

A recent employer survey in the Lower Mainland indicates that turnover in this occupational group is quite low. Industry sources also indicate that there is some shortage of skilled professionals even in populated areas such as the Lower Mainland.

People are more interested in staying healthy and looking good than they were in previous decades, and this trend will continue as baby boomers age. As more people come to realize the connections between good eating habits and disease prevention, dietitians and nutritionists are increasingly assuming a new role in promoting the health and well-being of the general population.

Dietitians and nutritionists working in their traditional settings (hospital-based clinical dietitians, for example) will probably continue to experience fair demand for their services. There are concerns that public funds allocated to hospitals will have limited growth and that this in turn may limit the employment growth for these workers. More employment opportunities are likely to be seen in long term or home care settings, such as nursing homes and residential care facilities. In these facilities, dietitians and nutritionists are more frequently working as counsellors and advisers to facilitate rehabilitation or to maintain general health.

On the other hand, non-traditional dietetic practices are being established and may prove to provide more promising career opportunities. These practices provide such services as sport nutrition, food industry consulting (helping with consumer research, product development and marketing) and community counselling. Given the public's growing interest in ways to stay healthy and live longer, the demand for these dietetic services should become greater over time. It is important to keep in mind that these are privately funded fields and may even be self-employment opportunities. Entrepreneurial skills are thus vital in addition to a sound knowledge of dietetics and a commitment to promoting preventive care.

Dietitians and nutritionists concentrate in populated urban centres. There should be better employment opportunities in rural communities, where competition is lower, particularly for those new to the occupation or new to the province.

Additional Information

UBC Faculty of Agricultural Sciences Program Food Nutrition and Health Page http://www.agsci.ubc.ca/main/fnh

Dietitians of Canada http://www.dietitians.ca

B.C. Transfer Guide http://www.bccat.bc.ca

Related Occupations

- college and other vocational instructors (4131)
- food service supervisors (in 621 sales and service supervisors)
- home economist (in 416 policy and program officers, researchers and consultants)
- managers of dietetic or nutrition departments (in 01/09 middle and other management)

> ***As more people come to realize the connections between good eating habits and disease prevention, dietitians and nutritionists are increasingly assuming a new role in promoting the health and well-being of the general population.***

Therapy and Assessment Professionals

NOC 314

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	2,480	3,850	4,550

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
700	380	1,080

Annual Growth 1998-2008 1.7%

Main Industries of Employment

Hospitals	48%
Other Health and Social Services	19%
Physicians, and Health Practitioners and Medical Labs	19%

Employment by Region

Lower Mainland	63%
Vancouver Island	19%
Northern B.C.	4%
Okanagan/Kootenay	14%

Self-employment 25%

Nature of the Work

Professionals in this group perform different tasks but they all share one common objective. They provide therapy to treat the impaired or disabled who have lost some abilities, so that their clients can enjoy a healthy life and achieve to their fullest potential.

Audiologists diagnose, evaluate and treat hearing disorders and impairment and their effect on communication.

Speech-language pathologists are concerned with disorders of speech and language that impair communication.

Physical therapists, also called *physiotherapists,* improve mobility, relieve pain and prevent or limit permanent physical disabilities of patients suffering from injuries or disease.

Occupational therapists help individuals with mental, physical, developmental or emotional disorders to develop, recover or maintain daily living and work skills.

Other therapists include *art therapists* who work with various artistic media, for example, *music therapists* and *dance therapists*. They also include *recreational therapists* who employ sports and games to help maintain and improve the physical, mental and emotional well-being of individuals.

Professionals in this group work in a large variety of settings. Many are employed by hospitals and health care centres. They also work in schools (audiologists and speech-language pathologists), long term care and rehabilitation facilities, psychiatric treatment facilities and sports injuries clinics. Some also work for professional sports teams, prisons, government agencies and even the armed forces. While most work as employees, others choose to run their own private practices.

3

Main Duties

The common responsibilities of any *therapist* include assessing patients' current abilities through different tests or other procedures, discussing the goals or abilities with the patients or their families and planning individualized programs of therapy, exercise or external aid.

These common duties also include observing the progress of treatment, recording assessment results and revising therapy when necessary. In addition, therapists maintain a close relationship with doctors and other health care professionals. This is because typically a patient is referred to a therapist by a general practitioner, and progress is reported to the general practitioner for diagnosis and evaluation.

Therapists also have a role in educating the public and community interest groups.

Depending on the nature and degree of impairment or disability, therapists perform specific tests and apply different treatments.

In addition to these duties, *audiologists* may also work as consultants to school boards to ensure that the needs of hearing-impaired students are met. Those in private practice may also dispense hearing aids through their offices.

Speech-language pathologists use tools varying from those as simple as books, pictures and toys, to sophisticated sound analysers and amplifiers and electronic communication devices.

The patients physical therapists treat include accident victims and disabled individuals with conditions such as multiple sclerosis, cerebral palsy, nerve injuries, burns, amputations, head injuries, fractures, lower back pain, arthritis, heart disease, stroke and sports injuries. Treatment often includes exercise to increase patients' flexibility in stiff joints or unused muscles, as well as to improve strength, balance, coordination and endurance. *Physical therapists* also use electricity, heat, cold, or ultrasound to relieve pain. They may use massage to restore function.

Occupational therapists use activities of all kinds. Practical activity increases patients' strength and dexterity. For example, a patient with coordination problems might be given tasks to improve hand-eye coordination. Computer programs have been designed to improve decision making. For those with permanent functional disabilities, occupational therapists provide adaptive equipment, such as wheelchairs, splints and aids for eating and dressing. They also teach patients to operate computer-aided adaptive equipment. Occupational therapists in mental health settings use activities to help patients cope with daily life, for example, time management, budgeting, shopping, homemaking and using public transit.

Art therapists use simple art materials in a non-threatening atmosphere. They encourage clients to express feelings or fears through, for example, visual representation and movement in the therapeutic process.

Recreational therapists organize activities, such as games, sports, and field trips, to help their clients build confidence, socialize effectively and remedy the effects of illness or disability or age.

Example Titles

audiologists and speech-language pathologists (3141):

- audiologist
- educational audiologist
- research audiologist
- speech-language pathologist
- speech therapist

physical therapists (3142):

- physical therapist
- physiotherapist

occupational therapists (3143):

- clinical occupational therapy specialist
- community occupational therapist
- occupational therapist

other therapists (3144):

- art therapist
- athletic therapist
- dance therapist
- music therapist
- recreational therapist

©Stone/Vancouver

Education and Training

Physical therapists require a university degree in physical therapy, with a period (1,000 hours) of supervised practical training, and must satisfactorily complete the Physiotherapy National Examination set by the Alliance of Physiotherapy Regulatory Boards (to be written after a program of study has been completed). Registration and licensing with the College of Physical Therapists of B.C. is required for employment.

The University of British Columbia's (UBC) School of Rehabilitation Medicine offers a bachelor's degree in physical therapy. Applicants are selected for this four-year program (includes one year of prerequisite science courses) on the basis of academic standing, a first aid certificate and 70 hours of volunteer or paid work relating to this area. Students are advised that admission is restricted by the limited number of clinical placements. Students are also required to complete a four- to eight-week clinical field work experience.

A Bachelor of Health Science (Physiotherapy) degree program is offered by the Open University in association with the College of Physical Therapists of B.C. (CPTBC) and the Canadian Alliance of Physiotherapy Regulators (the Alliance) for licensed *physiotherapists* who are graduates of a three-year diploma program or equivalent. This program provides the skills and knowledge necessary to be eligible for career progression to senior practice positions or for application to graduate school.

Audiologists and *speech-language pathologists* require at least a master's degree in audiology or speech-language pathology. Licensing is not compulsory in B.C., although some employers insist that employees be eligible both for certification with the Canadian Association of Speech-Language Pathologists and Audiologists and for registration with the B.C. Association of Speech-Language Pathologists and Audiologists.

UBC's School of Audiology and Speech Sciences offers a two- to three-year (depending on the number of prerequisite courses already completed), full-time graduate program leading to a Master of Science (MSc) degree in either Audiology or Speech-Language Pathology. Admission to this program is competitive. Admission requirements include an undergraduate degree usually taken in linguistics (UBC or University of Victoria graduates should complete the Speech Science major in the Department of Linguistics or Psychology) as well as specified science, mathematics and psychology courses.

Occupational therapists require a university degree in Occupational Therapy or Rehabilitation and must undergo a period of supervised practical training. In order to be eligible for certification with the Canadian Association of Occupational Therapists and for registration with the B.C. Society of Occupational Therapists, degree holders must pass the Canadian Association of Occupational Therapists Certification Examination. Certification and registration are not required for employment but are often requested by employers.

UBC's School of Rehabilitation Medicine offers a four-year bachelor's degree in Occupational Therapy (the first year may be taken at another institution). Entrance requirements are similar to those listed in the UBC Physical Therapy program as listed above. A four- to eight-week clinical field work experience is also required prior to graduation.

Music therapists require a university degree in music therapy, and accreditation with the Canadian Association for Music Therapy is highly recommended. Capilano College, in collaboration with the Open University, offers the third and fourth years of a bachelor's degree in Music Therapy. This program includes field work in different settings for each of the terms. Admission requires grade 12 graduation and two years of university, including specified courses in music, psychology and other areas (one full year of which must be at the university level of music history, music theory, ear training and sight singing). Basic guitar and keyboard skills at the level of university class piano are required. Experience working with people who have special needs is an asset.

Douglas College offers a two-year Therapeutic Recreation program for *recreational therapists*. Enrollment is limited, so early application is recommended. Both full- and part-time study are possible. Fifteen weeks of clinical/practical experience are included. Applicants must have completed grade 12 or equivalent, have at least 45 hours of paid or volunteer experience, be 19 years of age by December 31 of the year they enroll, complete a writing skills assessment and provide a satisfactory Criminal Record Check and proof of good health. There are currently no licensing requirements for recreational therapists.

Therapy and *assessment professionals* must have an aptitude for science and mathematics, as well as patience, flexibility, tact, resourcefulness and emotional stability in order to help patients and their families understand treatments and adjust to disabilities. Good communication and analytical skills and a willingness to cooperate with other health professionals are required. Continual upgrading of knowledge in relation to the field is important. Occupational therapists and physical therapists also need manual dexterity and physical stamina.

Working Conditions

Most professionals in this group work in clean, well-lit and well-equipped offices. Most of these workers are in hospitals, schools or community clinics. Some *therapists* choose to be in private practice, and they work in offices of their own, or in group practices.

Full-time professionals in this group generally work a 36 hour week. Although they don't have to answer emergency calls, they sometimes have to adjust their hours to meet clients' needs, which can include working evenings and weekends.

Some *audiologists, speech-language pathologists, physiotherapists* and *occupational therapists* who provide home health care may have to travel extensively every day from home to home, or from town to town, especially in small communities.

Other than speech-language pathologists, audiologists and to some extent art therapists, most therapists' work can be physically demanding. For example, they have to lift and turn patients and handle heavy equipment. They are on their feet most of the day.

The estimated average annual earnings for professionals in this group in B.C. were $37,300 in 1995. Full-time, full-year professionals earned $46,700 per year on average. The respective all-occupation averages in the province in 1995 were $27,900 and $39,400. On average, physiotherapists earn $49,800, occupational therapists earn 39,600, audiologists and speech-language pathologists earn $48,200, and other professional occupations in therapy and assessment earn substantially less ($23,900).

This is a medium-sized occupational group. The employment level for the group was 3,850 in 1998, up from 2,480 in 1990. Physiotherapists are the largest occupation, with 45% of the workers in this group. Occupational therapists make up 22% of this group, and speech-language pathologists and audiologists account for about 16%.

One-quarter of the professionals in this group are self-employed, compared to 15% for all occupations in B.C. Among them, physiotherapists have the highest rate of self-employment (35%), and audiologists and speech-language therapists are the least likely to be self-employed.

About 28% of therapy professionals in this group work part time. By comparison, 26% of the overall B.C. workforce works part time. This work is only mildly sensitive to business conditions and is not seasonal. As a result, the unemployment rate for this group of professionals is much lower than the provincial average.

Professionals in this group are mainly employed in hospitals (48%) or in the offices of health care practitioners (19%), such as the offices of physiotherapists or occupational therapists. They are also found in other health and social services (19%), such as public health clinics and rehabilitation clinics. As a separate group, audiologists and speech language pathologists can be found in educational settings (40%), and occupational therapists generally work out of institutional settings, such as hospitals (62%). In general, they are located according to the population concentration, with a slightly higher than average concentration in the Lower Mainland (63%) and fewer than average practitioners per population (4%) in Northern B.C.

Women continue to make up a dominant share of these occupations (83%), but more men are also choosing to enter this profession. The majority of workers (64%) in this group are between the ages of 25 and 44.

Employment Prospects

Employment for professionals in this occupational group is projected to grow at an average rate of 1.7% per year, about the same as the average for all occupations in B.C. through to 2008, according to the Canadian Occupational Projections System (COPS). The total number of job openings between 1998 and 2008 is estimated at 1,080, or an average of 110 openings per year. About two-thirds of the total openings are expected to be due to population and economic growth, with the remaining one-third due to retirements.

This is a fairly stable occupational group. Professionals in their own specialties usually stay in their own field until they retire or leave the labour force to raise their families. There will be few openings due to turnover.

Although each type of profession within this occupational group is expected to experience similar growth patterns over the next ten years, total openings for each specialty will be quite different, as the size of each occupation is quite different. *Physiotherapists,* the largest occupation in this occupational group, are expected to have 480 openings between 1998 and 2008. *Occupational therapists*, the second largest, are likely to see a total of 280 openings in the same period. Audiologists and speech-language pathologists, and other therapists, are expected to see a total of 180 and 140 openings respectively.

Industry sources indicate that all types of professionals in this occupational group have experienced significant employment growth in the past decade. They also indicate that currently there is a sufficient supply of professionals in populated urban centres, such as the Lower Mainland, while the northern and rural parts of the province still experience some shortage. New university graduates are more likely to find part-time or casual employment in large cities.

The continuing and steady demand for the services of professionals in this occupational group is based on a growing and aging population. As more boomers start reaching their older middle ages, the overall demand for various health care and therapy services is expected to increase. For example, elderly people are more likely to suffer from chronic and debilitating conditions, such as heart attacks, strokes and loss of hearing, and will therefore require therapeutic services. In the long run, more employment opportunities are likely to be in long term care facilities, senior residences, and other community-based rehabilitation centres.

Many people are also more aware of the importance of living a healthy life and taking measures of preventive care. In the future, it is expected that more therapists will find employment or business opportunities in product development, worksite design, exercise program development and marketing preventive care products and services.

Probably the most important factor supporting a steady demand for therapists in this occupational group is that of technological innovations and advancements. Survival rates after severe injuries have improved because of the development of more advanced life-saving technologies. Newborns with severe birth defects will probably require ongoing treatment and therapeutic services. Continuing employment opportunities for therapists should arise in rehabilitative care centres and group homes, where they help those with disabilities to gain independence, and in insurance companies.

Government funding may limit the employment growth for this occupational group. The provincial government is expected to continue facing fiscal constraints in the near future, which means that the overall level of funding allocated to therapeutic services will probably see limited growth. Under the current health care policy in the province, for example, physiotherapy services are funded by the

B.C. Medical Services Plan (MSP), although some physiotherapists have opted out of MSP and can bill patients directly for their services. The capping of MSP funding for physiotherapy service would limit new employment opportunities in the public system. Employment opportunities in hospitals are also expected to see limited growth in the near future.

Individuals who consider entering one of these professions are advised to consult training institutes and industry sources for up-to-date information on specific service outlook and employment opportunities before making career and training decisions.

Additional Information

For physiotherapy:
UBC School of Rehabilitation Sciences
http://www.rehab.ubc.ca

College of Physical Therapists of B.C. http://www.cptbc.org

B.C. Society of Occupational Therapists
http://www.interchange.ubc.ca/bcsot

For audiology and speech-language:
UBC School of Audiology and Speech Sciences
http://www.audiospeech.ubc.ca

Canadian Association of Speech-Language Pathologists and Audiologists http://www.caslpa.ca

B.C. Association of Speech-Language Pathologists and Audiologists http://www.bcaslpa.bc.ca

For music therapy:
Capilano College Music Therapy Program
http://www.capcollege.bc.ca/programs/music_therapy/index.html

Related Occupations

- managers in health care (in 01/09 middle and other management)
- other technical occupations in therapy and assessment (3235)

Individuals who consider entering one of these professions are advised to consult training institutes and industry sources for up-to-date information on specific service outlook and employment opportunities before making career and training decisions.

Registered Nurses

NOC 3152

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	22,100	29,410	33,460

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
4,050	8,830	12,880

Annual Growth 1998-2008	1.3%
Main Industries of Employment	
Hospitals	91%
Physicians, and Health Practitioners and Medical Labs	4%
Other Health and Social Services	3%
Employment by Region	
Lower Mainland	56%
Vancouver Island	21%
Northern B.C.	8%
Okanagan/Kootenay	16%
Self-employment	1%

Nature of the Work

This group includes *registered nurses* (RNs), *registered psychiatric nurses* (RPNs) and *licensed graduate nurses* (LGNs). Nurses provide direct nursing care, using nursing knowledge and skills, to consumers of health care. They provide overall management of patient care by working with other care providers, deliver health education and education for prospective health care workers and do research. They may manage nursing and other parts of the health care system. They may also participate in policy making.

Nurses are employed in traditional and specialized health care settings, or in other community settings. These include hospitals, nursing homes, extended-care facilities, community health agencies, health centres and clinics, rehabilitation centres, mental health centres, doctors' offices, schools, government, companies and private homes. Nurses may also be self-employed.

In B.C. both RNs and those trained specifically as RPNs are qualified to practise nursing in psychiatry and mental health.

Licensed graduate nurses are a special category of nurses who are licensed by the Registered Nurses Association of B.C. to practise nursing, but they are not permitted to use the title "registered nurse." They are individuals who were employed in B.C. in a capacity substantially equivalent to registered nurses at any time during the two years prior to September 30, 1988, who were never registered nurses and, at the time of application to the licensing authority, did not qualify as registered nurses. However, no application to the registration authority as a licensed graduate nurse was possible after September 30, 1990.

Main Duties

While there are provincial laws regulating the nursing scope of practice, it is usually the work setting that determines day-to-day job activities.

Hospital nurses form the largest group of nurses. Most are staff nurses, who provide bedside nursing or direct care. They consult with physicians and other members in the health care team about an effective care plan. They may also supervise the care of patients by licensed practical nurses and aides. (Licensed practical nurses and aides are profiled in NOC 3233 and 3413 respectively.) Hospital nurses may be assigned to one area, such as surgery, critical care, maternity, pediatric, geriatric, psychiatric, emergency room or intensive care, or they may rotate among departments.

Nurses working in *long term care* or *extended care* settings manage nursing care for residents with conditions ranging from fractures to Alzheimer's disease. They assess residents' physical, psychological and social conditions, develop care plans, supervise the care of residents by licensed practical nurses and nursing aides, and perform difficult procedures, such as starting intravenous fluids. They also work in specialty care departments, such as long term rehabilitation for stroke and heart-injury patients or life skills programming for patients in psychiatric hospitals.

Community health nurses work in government, private agencies, clinics, schools, retirement communities, homes and other community settings. They may provide direct care or make referrals to other health care providers. They may engage in health education, health promotion and illness prevention for individuals, families and community groups. *Public health nurses*, one type of community health nurse, focus on the prevention of health problems. They provide for immunizations, blood pressure testing and other health screening. They also work with community leaders, teachers, parents and physicians in community health education. They may provide supportive counselling in mental health clinics. Some community health nurses work in home care, providing nursing care and coordinating delivery of other health care and supportive services.

Private duty nurses care for patients needing constant attention. They work directly for families on a contract basis or for a nursing or temporary help agency that assigns them to patients.

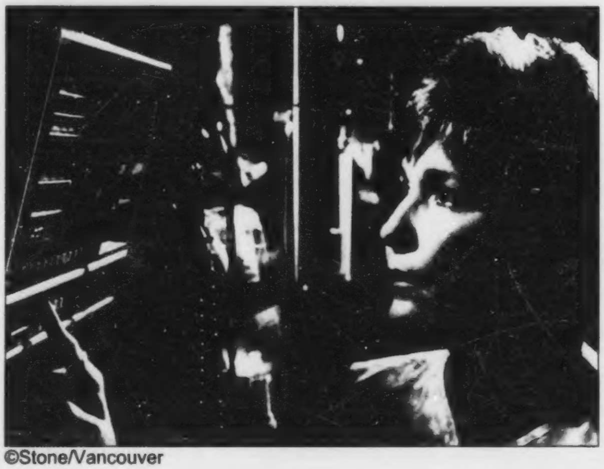
Office nurses assist physicians in private practice, clinics and emergency medical centres. They prepare patients for and assist in examinations, administer injections and medications, dress wounds and incisions, assist with minor surgery and maintain records. Some also perform routine laboratory and office work.

Occupational health nurses provide nursing care at worksites, to employees, customers and others with minor injuries and illnesses. They provide emergency care, prepare accident reports and arrange for further care if necessary. They also provide health counselling, assist with health examinations and vaccinations, and work on accident prevention programs.

Some nurses may engage in research activities related to nursing and health care.

Example Titles

- community health nurse
- critical care nurse
- licensed graduate nurse (LGN)
- mental health nurse
- nurse clinician
- nurse educator
- nursing consultant
- nursing researcher
- occupational health nurse
- private duty nurse
- public health nurse
- registered nurse (RN)
- registered psychiatric nurse (RPN)



©Stone/Vancouver

Education and Training

Nursing education programs at the entry-to-practice level (basic level) are offered throughout B.C. at public colleges, university colleges, universities and one technology institute. Diploma programs (two-and-a-half to three years in length) and baccalaureate programs (four years in length) are available. All entry-to-practice programs are reviewed by the Registered Nurses Association of British Columbia (RNABC) to determine if they meet the requirements for Association approval. Graduates from RNABC-approved programs are eligible to apply for registration, and once they have met all other requirements, such as passing the Canadian registration examinations, they become registered. Registration allows them to use the designation "Registered Nurse" (RN) and "nurse" and to practise as a *registered nurse* in B.C.

The minimum requirement for admission to a nursing program is grade 12 or equivalent, with mathematics and science courses. Certification in cardio-pulmonary resuscitation (CPR) is required, as well as evidence of current immunization and a criminal record check. Some programs also require university level courses, such as English. Paid or volunteer experience in health care can be an asset.

Entry-level diploma programs of approximately two-and-a-half to three years duration are available. Diplomas can be completed through a collaborative nursing program offered throughout the province by the University of Victoria (UVic) and nine college partners (Camosun College, Douglas College, Kwantlen University College, Langara College, Malaspina University College, North Island College, Okanagan University College, Selkirk College and University College of the Cariboo). University College of the Fraser Valley and the British Columbia Institute of Technology (BCIT) also offer diploma programs. College of the Rockies offers the first year of the BCIT program.

Entry-level BSN programs are available at the University of British Columbia (UBC), the University College of the Fraser Valley (in collaboration with the Open University) and the University of Northern B.C. Students who enter diploma programs within the collaborative nursing program can request, while in progress, to opt for a Bachelor of Science in Nursing (BSN) degree completion route at one of several available sites.

Post RN, Nurse Refresher, Graduate Nurse Refresher, Graduate Nurse Qualifying and Access Nursing programs are available. Several of the colleges, university colleges and the Open University provide RNs who have not practised for a minimum of five years with an opportunity to refresh their knowledge and skills in preparation for returning to practice. Kwantlen University College also offers an upgrading program in English for graduate nurses from other countries (who are required by the RNABC to upgrade their English language skills and their nursing competencies prior to writing the Canadian nurse registration examination).

Kwantlen University College also prepares graduate nurses who were educated in other countries but not trained in areas such as maternal/newborn nursing, mental health nursing or pediatric nursing. This Graduate Nurse Qualifying Program meets educational requirements for nurse registration in B.C.

Several colleges throughout the province provide Licensed Practical Nurses (LPN) and Registered Psychiatric Nurses (RPN) with access to a BSN or Diploma (General) Nursing program. The access program gives credit to the LPN or RPN for previous education and nursing practice and provides an opportunity for that person to complete the program in an efficient manner.

Specialty degrees and certificates are also available. To work in specialty areas, such as critical care or operating room, registered nurses require further education and experience. BCIT offers practising RNs an opportunity to study in nursing specialties (critical care, emergency, neonatal, nephrology, pediatric care, pediatric critical care, perinatal, perioperative, occupational health and operating room nursing) through certificate programs or through a Bachelor of Technology in Specialty Nursing degree.

Many programs are available for RNs who are former diploma graduates. All the BSN programs in B.C. provide these RNs with an opportunity to complete a BSN degree. Practising RNs are given credit for their diploma nursing education and complete the last two years of the BSN program either full time or part time on campus or part time through distance education.

Postgraduate programs can be completed at UBC and UVic. UBC offers programs leading to both a master's and a doctoral degree in Nursing. UVic offers a master's degree in Nursing through a multidisciplinary program or by special arrangement. UVic also offers a PhD program by special arrangement.

A two-year Psychiatric Nursing Diploma is available through Douglas College for those individuals wishing to become a *registered psychiatric nurse*. Graduates are eligible to write the registration examinations of the College of Registered Psychiatric Nurses of B.C. (CRPNBC). If successful, they are eligible to register with the CRPNBC, a requirement in order to practise as a psychiatric nurse in the province. Registered Psychiatric Nurses (RPNs) can enroll in Douglas College's clinically focused Advanced Diploma Program in Psychiatric Nursing (which is also open to RNs with appropriate experience and education). A psychiatric nursing refresher program is also available at Douglas College. Applicants should be referred from the CRPNBC or may be self-referred in other circumstances. The program was developed to aid psychiatric nurses to return to practice and to help foreign or other Canadian psychiatric nurses to meet educational requirements in order to write CRPNBC-certifying exams.

The Open University, in cooperation with Douglas College, offers a Bachelor of Health Science (Psychiatric Nursing). This degree program is designed to give RPNs and RNs working in a psychiatric/mental health field an opportunity to obtain a baccalaureate degree, following completion of the Advanced Diploma Program in Psychiatric Nursing.

Individuals who are considering nursing as a career should possess problem-solving abilities, effective communication skills, mathematics and science skills, good judgement (especially in stressful situations), patience, understanding and a caring attitude, an interest in learning on a continuing basis, flexibility, enthusiasm and an ability to give and receive constructive criticism. Nursing requires compassion, dependability, maturity, self-discipline and an ability to work cooperatively with others. Nurses must be able to handle the high levels of stress that come with emergencies and human suffering.

Working Conditions

Nurses generally work in well-lit, clean health care facilities. *Community* and *public health nurses* may travel to patients' homes and to schools, community centres or other sites. Nurses may spend a considerable amount of time standing and walking. Most have to work 8 to 12 hour shifts, usually on rotation, and may work weekends and evenings. Nurses work 36 hours a week on average. If they are in occupational and public health nursing, they are more likely to work regular office hours. Nurses have to have considerable physical and emotional stability to cope with the stress arising from caring for and working with those who are ill. Working in hospitals and clinics usually exposes nurses to hazards of infectious diseases, radiation or chemicals, and to prevent such dangers, nurses follow strict guidelines.

The estimated average earnings for all nurses in B.C. were $34,200 in 1995. About 45% are employed full time, full year, and these nurses' earnings averaged $43,000. The respective all-occupation averages in the province in 1995 were $27,900 and $39,400.

Earnings for nurses vary depending on skills, the number of years of experience, bargaining power and other factors. Unionized nurses at entry level earn about $21 an hour, while experienced nurses can earn $30 an hour and more. Non-unionized nurses generally earn less. According to a recent graduate survey, entry-level nurses averaged $2,900 per month and worked about 32 hours per week.

This is a very large occupational group. Employment for nurses was estimated at 29,400 in 1998, up 33% from 1990. Self-employment (1%) is rare for this occupational group, while part-time employment is relatively common (39%). The all-occupation rate for part-time employment in B.C. is 26%. The unemployment rate is lower than the average for all occupations in B.C., reflecting relatively balanced employment demand. Employment is mildly sensitive to economic conditions but usually not affected by seasonal fluctuations.

Nurses are mainly employed by hospitals (91%). They are located according to the general population distribution, with most of them in the Lower Mainland (56%) and on Vancouver Island (21%).

This occupational group is dominated by women (95%). The average age of workers in this occupational group is 42, just higher than the provincial average of 38 for all occupations. This reflects the higher than average proportion (64%) of nurses who are in the age groups 35 to 54.

Employment Prospects

Health care in B.C. and Canada as a whole has gone through considerable change over the last few years, and more change is expected. Population growth, an aging population and technological advancement in diagnosis and treatment are contributing to increasing demands for health services. We are currently facing worker shortages in some health occupations and have waiting lists for many health services. This pressure is expected to continue in the future and is leading governments to explore alternative options to finance and deliver high quality health care. New approaches to medical service delivery are being considered in conjunction with other policy changes. There may be increased use of the Internet to provide information directly to health consumers as well as to support the delivery of services by health providers. Any of these changes has the potential to influence employment needs. The employment projections in the summary table and following paragraphs, unless otherwise stated, are from the Canadian Occupational Projection System (COPS) demand model. The COPS model draws on traditional health delivery patterns, including the historic relationship between population growth and demand for nursing services. As a result, COPS may not capture all the impacts of changing technology, delivery models and health policy on the provision of health care services in B.C. The COPS growth rate projected reflects population growth and the provincial budgetary constraints of the past few years.

Employment for *nurses* is forecast to grow at 1.3% per year through to 2008, slower than the average for all occupations in B.C. Since this is a very large occupational group, there will still be a large number of employment openings. Total openings are projected to be about 12,900 between 1998 and 2008, or almost 1,300 per year on average. Over two-thirds of these openings are expected to be to replace nurses retiring, and the rest will be new positions resulting from population growth. Many additional openings will occur as a result of nurses leaving the occupation, and this may be due to stress, interest in working in other occupations or leaving to raise a family.

Industry sources agree that there is currently a shortage of nurses in B.C., in all regions and setting, and across Canada. The current nursing shortage is expected to continue throughout the forecast period. As a result, employers are reviewing their ability to recruit and retain nurses. For example, the trend through the 1990s was toward increasing the numbers of casual workers, and many new graduates worked on a casual on-call basis for a number of years before getting regular status. This is now beginning to change. Employers have started to create more full-time positions in an attempt to both recruit and retain nurses. In addition, employers are creating longer orientation and mentorship programs for new graduates and new employees.

The majority of nursing programs at post secondary institutions have had many more applicants than seats available. Many stakeholders, including employers, unions and nursing associations, have lobbied government to expand the number of positions for nursing training in B.C. as one approach to address the nursing shortage. Consequently the B.C. government increased funding to provide for an additional 400 nursing seats in post secondary institutions in B.C. starting in the 2000/2001 academic year.

There will be many factors influencing the demand for nurses over the next few years. The population is growing and aging, and some industry sources believe that more health care resources, including nursing care, will be required as a result. Other industry sources dispute such tight connections between aging and increased medical care needs.

The role of nurses and other health care professionals may expand as governments consider alternatives to help contain the expansion of health care costs. One approach suggested is for primary care to be delivered by multidisciplinary teams consisting of doctors and other health professionals. Nurses would work alongside doctors as part of a primary care team and would provide patient care in situations where doctors' skills are not required. In such arrangements, they may be called nurse practitioners. This would free doctors to use their skills more effectively. Such a change in the role of nurses would probably increase their employment opportunities.

Technological changes and government policies can act to reduce potential growth in nursing opportunities and may also change how and where nursing care is provided. For example, technological innovations in patient care, which permit a greater number of medical problems to be treated with fewer days in the hospital, have an impact on hospital use and the demand for nurses. The number of patients who stay overnight in hospitals is expected to decrease as more procedures can be performed on an outpatient basis. Many sophisticated procedures that used to be available only in hospitals can now be performed in physicians' offices, at clinics and even in emergency medical centres. Further, increasingly complex treatment appliances can now be brought into patients' homes for use in treatment and therapy. While these technological changes do mean that more patients can be treated with the support of fewer nursing staff, they are also increasing the level of acute patient care in hospitals. It is increasingly the more seriously ill patients who are treated in hospitals. This may in turn increase the pressures for more nursing resources in hospitals.

Changing priorities and fiscal situations of provincial and federal governments directly affect the funding available for health care. The provincial government's fiscal constraints are limiting growth in funding available for health care in B.C. Health policies encourage the use of lower cost health care and of the technology now available. There is interest in reorienting the health care system away from reliance on hospitals and institutional care and toward programs in workplaces, schools and neighbourhoods to support the delivery of health services closer to patients' homes. These policies will influence the demand for nurses.

Industry sources expect that rural areas, especially those in Northern B.C., will see more employment growth for nurses than urban centres. Nurses specializing in critical care, geriatrics, respiratory care, long term rehabilitation, assessment and home care will see more employment opportunities.

With experience, nurses may also progress to supervisory positions, such as that of head nurse. Readers might want to consult other sources, including the B.C. Ministry of Health and professional organizations for nurses, for additional information before making career and training decisions.

Additional Information

Canadian Nurses Association http://www.cna-nurses.ca

Registered Nurses Association of B.C.
http://www.rnabc.bc.ca

British Columbia Nurses' Union http://www.bcnu.org

For *psychiatric nurses*
College of Registered Psychiatric Nurses of B.C.
http://www.crpnbc.bc.ca

Related Occupations

- nursing assistants (3233)
- licensed practical nurse (in 3233 nursing assistants)
- nurse aides (3413)
- therapy and assessment professionals (314)

The role of nurses and other health care professionals may expand as governments consider alternatives to help contain the expansion of health care costs. One approach suggested is for primary care to be delivered by multidisciplinary teams consisting of doctors and other health professionals.

Medical Technologists and Technicians (Except Dental Health)

NOC 321

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	8,370	10,690	12,670

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
1,980	4,010	5,990

Annual Growth 1998-2008 1.7%

Main Industries of Employment

Hospitals	66%
Physicians, and Health Practitioners and Medical Labs	20%
Education	5%

Employment by Region

Lower Mainland	63%
Vancouver Island	18%
Northern B.C.	6%
Okanagan/Kootenay	13%

Self-employment 2%

Nature of the Work

Professionals in this broad occupational grouping are members of the health care team in medical laboratories. They perform distinct yet related duties that can be categorized into four major groupings.

The first group, and by far the largest, is *medical technologists* and *assistants* who perform and interpret diagnostic tests in order to assist doctors to diagnose, monitor and treat diseases. The following are some examples.

Medical laboratory technologists (NOC 3211) collect and test specimens, such as blood, tissue and body fluids, to assist in the diagnosis, treatment and prevention of disease. With additional training, medical laboratory technologists may specialize in clinical chemistry, clinical microbiology, hematology, histotechnology, immunohematology and cytotechnology. In B.C. medical laboratory technicians (NOC 3212) are medical laboratory assistants who collect and prepare specimens for testing.

Radiological technologists (in NOC 3215) use highly sophisticated X-ray equipment, mammographs, or C.T. (computerized tomography) scanners to produce images that are used by radiologists to diagnose the extent of disease or injury. These images may be displayed on X-ray film, movie film, videotape, television monitors or computer read-outs.

Nuclear medicine technologists (in NOC 3215) use radioactive tracers that are generally injected into the bloodstream of patients. The path of the radioactive material is then followed as it travels through a patient's system and is picked up by the bones or organs to be examined. The images produced help determine the nature of a disease and the extent of involvement and also help measure responses to treatment.

Ultrasound technologists, or *medical sonographers* (NOC 3216) use medical devices to transmit ultrasound through various parts of the body. Through returned echoes, images are created on screens to show the shape and composition of organs, tissues and other body mass, such as fluid accumulation. The information from these images is then provided to a physician (a sonologist) for diagnosis and treatment.

Cardiology technologists (NOC 3217) are responsible for operating the electrocardiograph, an electronic instrument that records the variations in electrical potential resulting from the action of a patient's heart muscles. They are also responsible for operating ambulatory monitors, performing exercise tolerance testing and monitoring pacemakers and operating head-up tilt tables.

Electroneurophysiology technologists (NOC 3218) use sensitive electronic equipment to test the function of the central and peripheral nervous systems. The technology includes examinations of electroencephalograms (EEGs, which test the electrical activity in the brain), electromyograms (EMGs, which monitor the electrical activity of peripheral nervous and muscular systems) and evoked potentials (EPs, which analyse the electrical activity resulting from the stimulation of sensory pathways).

The second group is *paramedical personnel* who perform therapeutic procedures for patients under the direction and supervision of physicians. They include *respiratory therapists* (in NOC 3214), who use ventilators and other equipment to treat patients with heart or lung problems, *clinical perfusionists* (in NOC 3214), who provide technical support to cardiac surgeons and anesthetists during open-heart surgery, and *radiation therapists* (in NOC 3215), who deliver radiation therapy to cancer patients.

The third group is *prosthetists* and *orthotists* (in NOC 3219), as well as their technicians, who design, fabricate, fit and repair artificial limbs, braces and supports.

The fourth group includes *animal health technologists* (NOC 3213) who work with veterinarians to provide for the health care needs of animals.

Main Duties

Medical technologists and *therapists* follow certain common procedures, although the equipment and instruments used are different.

They verify requisitions and doctors' orders and then prepare equipment, instruments or fluids to give to patients in order to conduct the tests or therapy. It is important to ensure that all handling techniques and protective measures are followed, especially in handling radioactive materials.

They explain procedures to patients and may obtain pertinent information from patients or charts. They then position patients for examination or treatment.

During the test or treatment, these technologists or therapists operate, calibrate and monitor equipment and instruments. At the same time, they provide patients with physical and mental care (for example, by monitoring blood pressure, pulse and other vital signs).

After the test or treatment, they conduct data processing and maintain records to provide to doctors for further diagnosis. They also safely handle and dispose of any hazardous, infected or chemical substances and materials. They are also responsible for maintaining equipment and instruments in good condition.

Medical laboratory assistants (NOC 3212) are responsible for collecting and preparing regular medical laboratory samples for testing. They set up and clean laboratory equipment. In some smaller hospitals they may also conduct electrocardiograms (ECGs or EKGs, which trace and record the variations in electrical potential resulting from the action of patients' heart muscles).

The duties of *prosthetists* and *orthotists,* as well as *prosthetic* and *orthotic technicians* (in NOC 3219), include examining and measuring patients following physicians' specifications. They may also use computers and sketches to design appliances. They then fabricate or supervise the fabrication of the prosthetic or orthotic appliances and fit and adjust the devices for patients. They also instruct patients in the proper use and care of the devices.

©Stone/Vancouver

Animal health technologists (NOC 3213) may perform duties similar to those carried out by medical laboratory technologists, although their patients are small or large animals.

Example Titles

medical technologists and pathologists' assistants (3211) and medical laboratory technicians (3212):
- clinical immunology technologist
- medical laboratory technologist
- medical laboratory assistant
- medical laboratory technician
- pathologist's assistant
- nuclear medicine technologist

animal health technologists (3213):
- animal health technologist
- veterinary laboratory technologist

therapeutic technologists (3214):
- cardiovascular perfusionist
- clinical perfusionist
- respiratory therapist

medical radiation technologists (3215):
- mammography technician
- radiation therapy technologist
- X-ray technician
- radiography technologist

medical sonographers (3216):
- medical sonographer 3216
- ultrasound technologist 3216

electroencephalographic and other diagnostic technologists (3218):
- electroencephalographic (EEG) technologist
- electromyography (EMG) technologist
- electroneurophysiology technologist

other medical technologists and technicians (3219):
- orthotist
- prosthetist
- orthotic technician
- prosthetic technician

Education and Training

Medical Laboratory Technologists. The British Columbia Institute of Technology (BCIT) offers a Medical Laboratory Technology Diploma. Graduates are prepared to write the Canadian Society of Medical Laboratory Science (CSMLS) national examination for the title of Registered Technologist (RT). This qualification is usually required for employment as a medical lab technologist in Canada. The two-and-a-half- to three-year program consists of academic studies followed by a 12-month training period in a clinical facility. BCIT admission requires completion of grade 12. Graduates of the program can apply to the Bachelor of Medical Laboratory Science (BMLSc) program at UBC, which is approximately two years in length.

BCIT also offers a 13-month post-baccalaureate program in clinical genetics technology, which involves the investigation of chromosome bands and chromosome numbers in human cells. Admission requirements include a Bachelor of Science degree in biology or genetics, and applicants must be able to detect colour differences in the visual spectrum. A hospital-based training program in diagnostic cytology is offered by the B.C. Cancer Agency.

Those currently employed as medical laboratory technologists may advance in their positions by completing certifications in specialty areas, furthering their education, obtaining an Advanced Registered Technologist's certificate (ART) and/or by taking advantage of professional development activities. Interpersonal and computer skills are generally an asset.

Medical Laboratory Assistants. Vancouver Community College offers a five-month certificate program for people who wish to work as medical laboratory assistants. Admission requirements include completion of grade 12 or equivalent, successful completion of a language assessment, typing skills of 40 wpm, completion of a medical questionnaire, submission of a negative TB skin test or chest X-ray report and a criminal record check. The University College of the Cariboo offers a certificate program for medical laboratory assistants through distance education. This program was developed to help meet certification requirements in order to provide upgrading opportunities for medical laboratory assistants who are currently employed in a laboratory but are not certified. Professional certification for medical laboratory assistants is acquired though the B.C. Society of Medical Laboratory Science.

Medical Imaging and *Therapeutic Radiography Technologists.* BCIT offers a two-and-a-half year diploma program in Medical Radiography Technology. Admission requirements include grade 12 (with several science courses), basic typing and computing skills, volunteer work (at least 40 hours) in a hospital setting, Basic Life Support (Level C), a medical examination, proof of current immunization and an interview. If more than five years has elapsed since completion of grade 12, upgrading is necessary. Once students successfully complete their clinical training, they are eligible to write the certification examination set by the Canadian Association of Medical Radiation Technologists. For registered medical imaging technologists, BCIT also offers a self-paced degree completion program, offered through distance education, which leads to a Bachelor of Technology in Medical Imaging. Admission requirements include English 12, completion of the BCIT Medical Radiography Technology Diploma (or equivalent) and two years of relevant work experience.

BCIT also offers a two-year diploma program in Nuclear Medicine Technology. Nuclear medicine is the application of radioactive materials to the diagnosis and management of disease in humans. Entrance requirements include grade 12 with several science courses, an interview, current evidence of immunization and CPR Level C. On successful completion of the program, graduates are eligible to write the national examination set by the Canadian Association of Medical Radiation Technologists (CAMRT). Simon Fraser University grants two years of credit toward a Bachelor of Science degree to graduates of this program. Advanced certification is available.

A 12-month post-diploma program in diagnostics medical sonography (Ultrasound) is offered by BCIT. Prerequisites include a minimum two-year diploma in technology in an allied health field, such as radiography, nuclear medicine or registered nursing, or a Bachelor of Science in an appropriate health-related field. A four-month associate certificate program in adult echocardiography is also available.

A 27-month Radiation Therapy Diploma Program is offered by the B.C. Cancer Agency - Vancouver Cancer Centre. Admission requires two years of university, with courses in physics, math and English within the last five years or applied through relevant current employment. Graduates are required to write a national certification exam and, if successful, are eligible for membership in the B.C. Association of Medical Radiation Technologists (BCAMRT).

Prospective medical imaging/therapeutic radiography technologists must have a strong sense of responsibility, a caring nature, an interest in the well-being of others, excellent interpersonal skills, strong problem-solving skills and an ability to function as part of a team. The work is highly technical and exacting, and applicants must feel comfortable with complex instruments, possess considerable manual dexterity and have meticulous work habits. The profession is both physically and mentally demanding and therefore requires individuals who cope well in a stressful environment.

Cardiology/Cardiovascular/Respiratory Technologists/Therapists. BCIT offers a Cardiology Technology Diploma through distance education that prepares graduates for non-invasive diagnostic cardiology procedures. Level I, the first year of this program, was formerly known as the certificate level program. The diploma program now includes a second year (Level II). Completion of grade 12 is required, with some basic computer keyboard skills, for admission. After a designated period of work-related experience, graduates are eligible to write the national registration examination administered by the Canadian Society of Cardiology Technologists (CSCT). BCIT also delivers a part-time, post-diploma Cardiovascular Technologist program. Graduates become eligible to write the Canadian Association of Cardio-Pulmonary Technologists (CACPT) national exam.

The University College of the Cariboo offers a three-year Respiratory Therapy Diploma, and graduates are eligible to write the examinations for professional qualification as Registered Respiratory Therapists (RRT). Admission requirements include grade 12 (including math and sciences 12, which must have been completed within five years of the application), proof of current immunization and Level C (CPR) certification. The University College of the Cariboo also offers a post-diploma program for registered respiratory therapists, registered nurses and other suitable candidates in anaesthesia technology. A two-year (approximately) post-diploma program in cardiovascular perfusion technology through distance education for allied health professionals is also offered by the College.

Electroneurophysiology Technologists. A two-year Electroneurophysiology Technology Diploma is offered at BCIT. Individuals wishing to enter this field should be interested in the welfare of people and should have an aptitude for mathematics, physics and use of electrical and mechanical apparatuses. Completion of grade 12 and CPR certification are basic requirements for admission. After a period of work experience, graduates of the program will be eligible to write technologist registration exams.

Biomedical Engineering Technologists. BCIT also offers a two-year Biomedical Engineering Technology Diploma (the safe and correct performance of equipment used in medicine and biology). Admission requirements include grade 12, an interview and current evidence of immunization. Graduates of the program are eligible for registration as Applied Science Technologists (AScT) after two years of relevant work experience after graduation. The University of British Columbia offers a graduate program in biomedical engineering.

Prosthetists and *Orthotists*. Three accredited prosthetic/orthotic programs of study are offered in Canada. The George Brown College of Applied Arts and Technology in Toronto and BCIT in Burnaby offer two-year programs, and Montmorency College in Laval, Quebec offers a three-year program (instruction in French). The George Brown College of Applied Arts and Technology also offers a two-year post-diploma program focusing on clinical methods in orthotics and prosthetics. Entrance requirements for BCIT's program include a high school diploma. Applicants should have a good academic background, manual dexterity, mechanical aptitude and good interpersonal skills. After 22 months' work experience under the guidance of a certified orthotist or prosthetist, graduates are eligible to write the national certification examinations of the Canadian Board of Certification for Prosthetists and Orthotists.

The BCIT Prosthetics and Orthotics Diploma is a two-year program jointly funded by three Western Canadian provinces (B.C., Alberta and Saskatchewan). Applications are accepted every second year on a prorated basis from each of the three provinces. The most recent intake of students was in September 2000.

Animal Health Technologists. Animal Health Technologists are also included in this occupational group. The University College of the Cariboo offers a two-year Animal Health Technology diploma program. Graduates are trained to serve as paraprofessionals in the field of veterinary medicine. Completion of grade 12 plus a medical certificate, keyboarding skills, evidence of current immunization, evidence of orientation to veterinary practice and attendance at a interview are included as admission requirements.

Workers in this diverse occupational group should have an aptitude for science and mathematics and have an eye for detail. The operation of sophisticated equipment requires mechanical ability and manual dexterity. Technologists need to be resourceful, self-confident, willing to learn, detail oriented, physically and mentally alert, capable of working well with others, interested in science and able to work effectively in crisis situations. Prospective technologists are advised that since there are a limited number of places available in all of these programs, applications should be submitted early.

Working Conditions

Medical technologists and *therapists* in this group generally work in clean, bright and well-ventilated medical laboratories, clinics or offices in hospitals. Some *prosthetists* and *orthotists* work in laboratories of their own.

Most medical technologists and therapists work 35 to 40 hours a week. Those working in hospitals often must rotate shifts to work on weekends and holidays. However, medical technologists and therapists in small hospitals may also expect to be on call in case of an emergency.

The physical requirements to perform duties for medical technologists and therapists vary according to place of work. For example, for *medical laboratory technologists* and *assistants*, the work is light and comfortable, although there may be unpleasant odours or infectious materials to be handled. By contrast, the work for a *respiratory therapist* is physically demanding, as it involves a lot of bending and lifting. A *nuclear medicine technologist* or a *medical X-ray technologist* should always be aware of potential radiation hazards.

The estimated average annual earnings for all medical technologists and therapists in this occupational group were $35,500 in B.C. in 1995. Full-time, full-year medical technologists and therapists earned an average of $43,500. The respective all-occupation averages in the province in 1995 were $27,900 and $39,400.

There is a fair amount of variation among earnings for different occupations in this group. Earnings also vary depending on experience, responsibilities undertaken, location and other factors. Medical laboratory assistants provide assistance to technologists and doctors and other health care professionals, and their average annual earnings were $37,600 in 1995. On the other hand, medical technologists, therapists and prosthetists and orthotists earn more. In unionized environments, the annual earnings of medical laboratory technologists at entry level can be $38,000 and above. Other technologists and therapists earn similar ranges of salary. Respiratory therapists and clinical perfusionists generally earn the highest, with average annual earnings of $58,000. According to a recent graduate survey, entry-level salaries for these workers are approximately $2,910 per month for an average 33 hour work week.

This is a very large occupational group. In 1998, estimated employment was 10,690, up from 8,370 in 1990. The majority (27%) of these workers are medical laboratory technicians, medical laboratory technologists and assistants (32%) and medical radiation technologists (19%).

Industry estimates indicate that there were about 550 respiratory therapists employed in hospitals across the province as of the summer of 1996. In addition, almost 600 workers were employed as animal health technologists in 1996. Industry sources also indicate that there were between 50 and 60 prosthetists and orthotists employed in 1995.

As most of these workers are employees of hospitals, laboratories and other health care facilities, self-employment is rare within this occupational group. There is about the same proportion of part-time workers (27%) in this occupational group as the workforce average. However, part-time work, casual and on call work are all becoming more prevalent.

The unemployment rate for medical technologists and therapists is below the average for all occupations in B.C. Employment is not affected by seasonal fluctuations but may be affected by general economic conditions.

Workers in this occupational group are mainly employed in hospitals (66%) and in physicians' offices, health care practices and medical laboratories (20%). In terms of geographical distribution, these workers are located according to population distribution, although there is a higher than average proportion in the Lower Mainland (63%). There is also a large proportion of this group in Victoria (11%), while Northern B.C. is slightly underrepresented (6%).

Women make up a majority of those employed in this broad occupational group (79%), with the exception of respiratory therapists and clinical perfusionists where relatively fewer women (47%) work.

As most of the people in this occupational group go through some post secondary education and training, there are relatively few technologists and therapists younger than age 25. The majority are between age 25 and 44. The average age for the occupational group as a whole is 38.

Employment Prospects

Health care in B.C. and Canada as a whole has gone through considerable change over the last few years, and more change is expected. Population growth, an aging population and technological advancement in diagnosis and treatment are contributing to increasing demands for health services. We are currently facing worker shortages in some health occupations and have waiting lists for many health services. This pressure is expected to continue in the future and is leading governments to explore alternative options to finance and deliver high quality health care. New approaches to medical service delivery are being considered in conjunction with other policy changes. There may be increased use of the Internet to provide information directly to health consumers as well as to support the delivery of services by health providers. Any of these changes has the potential to influence employment needs. The employment projections in the summary table and following paragraphs, unless otherwise stated, are from the Canadian Occupational Projection System (COPS) demand model. The COPS model draws on traditional health delivery patterns, including the historic relationship between population growth and demand for nursing services. As a result, COPS may not capture all the impacts of changing technology, delivery models and health policy on the provision of health care services in B.C. The COPS growth rate projected reflects population growth and the provincial budgetary constraints of the past few years.

Employment for *medical technologists* and *technicians* is projected to grow at an average rate of 1.7% per year, about the same as the average for all occupations in B.C. through to 2008, according to the Canadian Occupational Projections System (COPS). Since this is a very large occupational group, the total number of job openings will also be large and between 1998 and 2008 are estimated at 5,990, or an average of about 600 openings per year. About two-thirds of the total openings are expected to be the result of retirements. The other third will be due to population and economic growth.

There will be additional openings due to turnover for medical laboratory technicians. Many workers are attracted to this occupation as a stepping stone to other more skilled positions. For technologists who have gone through much specialized training, turnover rates are generally low.

The growth rate for this occupational group is influenced by the projection of average growth for the two largest occupations in this group, *medical laboratory technologists* and *pathologist assistants*, and *medical laboratory technicians*. These two occupations can expect to see total openings of 1,860 and 1,540 respectively over the next decade.

Other types of technologists are expected to experience higher than average employment growth rates, but these occupations tend to be very small in size. *Medical radiation technologists* are expected to have a total of 1,220 employment openings, while *therapeutic technologists* (respiratory therapists and clinical perfusionists) are expected to see a total of 470 openings. Approximately 200 total openings will be seen for each of the occupations *medical sonographers* and *cardiology technologists*. *EEG* and *other diagnostic technologists* are expected to have a total of 130 openings. In the case of orthotists and prosthetists and their technicians, all openings over the next decade are expected to be the result of replacement needs only.

The potential growth pattern for *animal health technologists* will probably be similar to that for veterinarians (see NOC 3114 Veterinarians). The state of the art of the specific types of technologies used by these workers, and how those technologies evolve, will have an impact on potential employment opportunities in the near future. For example, industry sources have mixed views about employment outlooks for medical laboratory technologists. Some employers indicate that there is currently a shortage of workers, particularly those with three to five years of experience. Other industry sources predict a net decrease in demand as testing procedures become more automated. Industry sources also indicate that medical laboratory assistants are taking over some of the more labour intensive jobs from technologists as those jobs become technically less specific. In the long run, it is likely that advances in laboratory automation and increasingly simple tests will continue to reduce the demand for medical laboratory technologists. At the same time, the development of new types of tests and more specialized testing in the areas of chemistry, haematology, blood banking, immunology and microbiology will continue to provide ongoing opportunities for those new to the occupation.

Technological advances have not reduced employment for other medical technologists and technicians, such as respiratory therapists and clinical perfusionists, medical radiation technologists, medical sonographers, and cardiology technologists. A growing number of persons are developing respiratory conditions, and in an aging population, heart attacks and other conditions become an increasing consideration. The demand for those who specialize in testing these problems or in providing therapeutic treatment is expected to be strong. The size of these occupations is very small, however, and the number of new openings will be few.

Those who are interested in looking for employment in hospital settings are advised that full-time positions are hard to get when starting a career. There will, however, be plenty of on call and part-time opportunities.

Individuals who consider entering one of these technologist occupations are advised to consult training institutes and industry sources for up-to-date information on specific service outlook and employment opportunities before making career and training decisions.

Additional Information

Canadian Society of Laboratory Technologists
http://www.cslt.com

For information on radiation therapy:
B.C. Cancer Agency School of Radiation Therapy
http://www.bccancer.bc.ca/rtschool

British Columbia Association of Medical Radiation Technologists http://www.bcamrt.bc.ca

For information on cardiology:
Cardiology at the British Columbia Institute of Technology
http://www.health.bcit.ca/cardiology

Canadian Society of Cardiology Technologists
http://www3.telus.net/bcboys/CSCT.html

For information on prosthetics:
George Brown College Health Sciences Programs
http://www.gbrownc.on.ca/Marketing/FTCal/cshsci.html#health

Related Occupations

- other technical occupations in therapy and assessment (3235)
- pet groomers and animal care workers (648)
- physical and life science technologists in non-medical laboratories (in 221 technical occupations in physical sciences and 2221 biological technologists and technicians)
- sonologist (in 3111 specialist physicians)

Dental Technicians and Laboratory Bench Workers

NOC 3220

B.C. Employment Trends and Projected Demand			
	1990	**1998**	**2008**
Number Employed	630	840	1,040
Estimated Openings 1998-2008			
	Growth (Net)	Attrition	Total
	200	20	220
Annual Growth 1998-2008		2.2%	
Main Industries of Employment			
Other Manufacturing		49%	
Physicians, and Health Practitioners and Medical Labs		34%	
Chemicals Manufacturing		10%	
Employment by Region			
Lower Mainland		63%	
Vancouver Island		18%	
Northern B.C.		5%	
Okanagan/Kootenay		15%	
Self-employment		33%	

Nature of the Work

Dental technicians design, construct, alter or repair dentures, bridgework, crowns and other dental prosthetic and restorative/orthodontic devices. These devices are prescribed by dentists, orthodontists and denturists. Dental technician supervisors are also included in this group.

Dental laboratory bench workers assist dental technicians in preparing and fabricating dentures and other dental devices.

Dental technicians and laboratory bench workers are employed in commercial dental laboratories. Some dental technicians own their private laboratories.

Technical note: In data provided by Statistics Canada and reported here in *Work Futures*, NOC (National Occupation Classification) occupations 3223 (Dental Technician) and 3412 (Dental Laboratory Technician) are combined to form SOC (Standard Occupational Classification) occupation 3220 (Dental Technicians and Laboratory Bench Workers). For more information, see the Technical Notes Appendix.

Main Duties

Dental technicians have the knowledge and experience to design, fabricate, modify and repair a series of dental devices. Their work is based on the prescriptions of dentists and denturists. These devices include complete or partial dentures, crowns, inlays, onlays, posts and cores, bridges and dental ceramics, and appliances used in orthodontics.

Dental laboratory bench workers assist dental technicians in performing such duties. For example, they prepare plaster models and moulds from dental impressions, prepare wax bite-blocks and impression trays, and cast gold or metal alloys for bridges and denture bases. They pack plastic material in moulds to form full or partial dentures. They also mould wax over denture models to form full contours of artificial gums, or make orthodontic bands from gold, silver, stainless steel or other metals. When the framework of dentures is finished, they polish and colour dentures to obtain a natural finish.

Both dental technicians and laboratory bench workers operate equipment and instruments, maintain clean working conditions in the laboratory and follow appropriate safety and first-aid guidelines, especially through practice of infection control procedures.

Example Titles

dental technicians (3223):
- dental technician
- dental technician supervisor

dental laboratory bench workers (3412):
- ceramic dental caster
- ceramic dental moulder
- dental laboratory bench worker
- denture finisher
- denture packer
- denture waxer
- orthodontic band maker

Education and Training

Dental technicians require completion of a college program in dental technology and approximately 18 months of supervised work in the industry (may be completed during and/or after the program) prior to being eligible to take the mandatory licensure exams. Licensing and registration by the College of Dental Technicians of British Columbia are required prior to becoming a "dental technician." Continuing education is required to maintain the licence. *Dental laboratory bench workers* (dental technician assistants) require at least a grade 12 education. On-the-job training is provided and may last up to two years.

The Dental Laboratory Technology Program is a two-year (20 months) cooperative education diploma for dental technicians offered at Vancouver Community College. The program is offered from September to June for two years and includes two practicum sessions comprising six weeks in total. Admission requires grade 12 or equivalent, with courses in English and biology 12 and chemistry and physics 11. In addition, applicants are required to have a valid First Aid Ticket (including basic CPR) and must complete successfully a manual dexterity test. Graduates are prepared to take the B.C. Dental Technician and Denturist Board Examination. Graduates receive a diploma and are eligible for registration and licensing. Those wishing to enter the program are encouraged to visit dental laboratories prior to enrollment to familiarize themselves with this occupational area.

Skills necessary in this field are a high degree of manual dexterity, good hearing and vision and an ability to recognize very fine colour shadings. Also important are scientific aptitude, an ability to follow instructions and attention to detail and precision work. Interpersonal communication skills, basic analytical skills, knowledge of new technology in relation to the field and adaptability are also important. Those who have respiratory problems or sensitive skin may be affected by some materials and consequently should discuss these potential concerns with an experienced technician.

Working Conditions

Working conditions vary depending on the type of laboratory, position held and the individual qualifications. Dental laboratories are usually well-ventilated and comfortable.

Those in this occupational group do not work directly on patients. Instead they receive orders from dentists, orthodontists and denturists. *Dental technicians* work either independently or in a team.

Each appliance fabricated is different from another. Therefore a great deal of expertise is required. Workers in this occupation must always keep up with technological advances.

Dental technicians and *laboratory bench workers* usually work a 40 hour week from Monday to Friday. Sometimes overtime is required if a certain prosthetic device has to be made to meet a deadline.

There are potential hazards associated with the work. For example, there is constant strain on eyesight from the detailed work required. There may be exposure to a variety of harmful fumes, gases and dusts. Further, there are strict guidelines that must be followed to avoid contact with potentially infectious material arriving from dental clinics.

The 1995 average annual earnings for dental technicians and laboratories bench workers in B.C. were $33,000. Full-time, full-year workers earned an annual average $37,800. The respective all-occupation averages in the province in 1995 were $27,900 and $39,400. Earnings vary depending on skills and experience. For those who own their own businesses, income also depends on their reputation.

This is a very small occupational group. The employment level in 1998 was estimated at 840, up from 630 in 1990. One-third of those working are self-employed (compared to the B.C. all-occupation average of 15%), and there is a smaller proportion of part-time workers in this occupation (13%) than the 26% average for all occupations in B.C. This, and the fact that a higher than average number work full time for the full year, suggest that there is a steady demand for dental laboratory workers.

The unemployment rate is much lower among this occupational group than it is in the overall workforce. Employment demand is generally not affected by business conditions, and the work is not considered seasonal.

In terms of industry distribution, almost half of dental technicians and dental laboratory bench workers are in dental laboratories (49%), and roughly a third (34%) are in dentists' and health practitioners' offices. In terms of geographic distribution, these workers are located according to the overall provincial workforce distribution but with a slightly higher than average proportion in the Lower Mainland (63%).

Women are fairly well represented in this occupational group, at 40% of the total, although this is still lower than the proportion of women in the overall workforce (46%). There is a larger than average proportion of workers in this occupation between the ages of 35 and 54. The average age of these workers is 40. The fact that there are fewer workers under the age of 25 reflects the need to acquire formal post secondary education in order to get into the occupation.

Employment Prospects

Employment for *dental technicians* and *laboratory bench workers* is projected to grow at an average rate of 2.2% per year through to 2008, faster than the average for all occupations in B.C. according to the Canadian Occupational Projections System (COPS). This is a very small occupational group, and the total number of job openings between 1998 and 2008 is estimated at only 220, or an average of 22 openings per year. Over 90% of total openings are expected to be the result of population growth, with the remaining 10% the result of retirements. There may not be many openings as a result of turnover, as these are fairly stable occupations.

This occupational group has experienced fairly strong growth over the past decade. Currently industry sources indicate that there is great demand for highly skilled dental technicians. COPS projects that the steady demand for dental devices and appliances provided by workers in this occupational group will continue in the near future.

Several factors affect the demand for dental technicians and laboratory workers. As the population gradually ages and more people want to keep their teeth longer, there will be increasing demand for corrective dental care, particularly in the restorative field. This should in turn provide continuing employment opportunities for dental technicians and laboratory bench workers.

Technological advancements over time, and the use of new materials and procedures, also may provide new business and employment opportunities. For example, cosmetic prosthesis, which uses white composite fillings to replace older or less attractive ones, may become more popular (there is currently only a limited clientele for this service, as cosmetic procedures are very expensive and are not usually covered by extended health insurance).

On the negative side as far as employment growth is concerned, the overall dental health of the population has improved substantially. This is because of the use of fluoride and other increasingly effective preventive treatments that have reduced the incidence of cavities. The growing awareness of preventive dental care by the public, through more frequent use of dental hygiene services, also means that people will be able to keep their teeth healthy longer. Full dentures will be a lot less common in the future, as most people will need only a bridge or a crown.

As the majority of dental laboratories tend to concentrate in populated areas, such as the Lower Mainland, competition for available openings is strong, especially for those new to the occupation or new to the province. Dental technicians and laboratory bench workers who are looking for jobs and experienced technicians looking for business opportunities may find more success in rural areas, particularly in Northern B.C.

Additional Information

For *dental technicians*
Vancouver Community College
http://www.vcc.bc.ca/catalogue/46_pro.htm

Related Occupations

- dental assistants (3411)
- dental hygienists and dental therapists (3222)
- denturists (3221)

Denturists

NOC 3221

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	80	110	130

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
20	0	20

Annual Growth 1998-2008 1.7%

Main Industries of Employment

Physicians, and Health Practitioners and Medical Labs	78%
Other Manufacturing	16%
Other Health and Social Services	7%

Employment by Region

Lower Mainland	43%
Vancouver Island	29%
Northern B.C.	10%
Okanagan/Kootenay	10%

Self-employment 57%

Nature of the Work

Denturists are also called *dental mechanics*. They examine patients and design, construct and repair dentures (artificial and removable teeth). Most denturists work in private practice.

Main Duties

Denturists take detailed measurements of patients' jaws to determine the size and shape of dentures required. Then they use various materials to make impressions of patients' teeth, gums and jaws. They fabricate dentures, or supervise dental technicians or laboratory bench workers who fabricate them.

When the dentures are completed, denturists fit them on patients and modify them if necessary. Denturists also repair, reline or rebase dentures.

Since most of these workers have their own denture practices, they have to look after the details of running a business and may hire and supervise technicians and assistants.

Denturists and dental technicians are closely related yet different occupations. *Dental technicians* not only fabricate dentures according to a dentist's or a denturist's prescription, but they also fabricate other dental devices, such as crowns, bridges and dental ceramics. Further, they do not deal with the public directly. In contrast, denturists work with patients and, under the current legislation in B.C., they can only make complete dentures but not partial dentures.

Example Titles

- denture technician
- denturist
- denture therapist
- denturologist

Education and Training

Denturists must complete a two-year post secondary diploma in denture therapy, an 18-month internship in a registered denture clinic both during and after the educational program, and satisfactorily complete the College of Denturists Licensure Examinations set by the College of Denturists of British Columbia. "Licensed Denturists" must be licensed and registered by the College of Denturists of British Columbia prior to employment.

An entry-level training program for denturists is offered at Vancouver Community College (VCC). The VCC program is 24 months in duration. However, it is currently under review, so please contact the school to determine its status. Admission requirements include grade 12 or equivalent, successful completion of a manual dexterity test administered by VCC, a medical questionnaire and proven good health. Students are prepared to take the theoretical examinations set by the College of Denturists of B.C. after graduation and to take the practical exams after an 18-month internship in a denturist clinic. After successful completion of these two exams, they can be registered and licensed.

Skills necessary in this field are a high degree of manual dexterity, good vision and an ability to recognize very fine colour shadings. Scientific aptitude, an ability to follow instructions and attention to detail and precision work are necessary as well. Interpersonal communication skills, empathy, excellent command of spoken and written English, basic analytical skills, knowledge of new technology in relation to the field and adaptability are also important.

Working Conditions

Denturists work in bright, clean and well-ventilated environments. While some of them work for an employer, most of them own their denture clinic or laboratory. The work is generally physically light but requires intense concentration for hours. Denturists also need to work with a variety of precision tools.

Denturists generally work a 35 to 40 hour week from Monday to Friday. Those who own their business may work overtime and on evenings and weekends in order to meet deadlines.

The average annual earnings for all denturists in B.C. were $32,000 in 1995. The average annual earnings of those working full time, full year were $36,300, slightly less than dental technicians. The respective all-occupation averages in the province in 1995 were $27,900 and $39,400. According to industry sources, those who own their business can earn substantially more, depending on their skills, reputation and client base.

There is great variation in earnings for denturists, from those at the entry level to those well experienced. According to industry sources, a new denturist starts off at between $9 and $14 an hour.

Denturists form a very small occupational group. Employment in B.C. was 110 in 1998, up from 80 in 1990. As previously mentioned, self-employment is common (57%), much higher than the workforce average of 15%. Only 10% of denturists work part time, which is lower than the 26% provincial average for all occupations.

Like other health care occupations in which many workers are in private practice, unemployment is almost non-existent. Employment demand is generally not affected by economic ups and downs or seasonal fluctuations.

In terms of industry distribution, denturists work mainly in denture clinics and laboratories (78%) and in scientific and professional equipment manufacturing (16%). They are located throughout the province. The Lower Mainland, with 47% of this group, has a lower share than the average for all occupations, but Vancouver Island has a higher than average share (32%).

There are fewer women in this occupation (26%) than the overall average of 46% in the workforce. However, more women have chosen this profession in recent years. The average age of all denturists is 44, higher than the workforce average of 38. This may be due to the fact that 15% of denturists continue to work beyond the usual retirement age.

Employment Prospects

Employment growth for *denturists* is projected to be at an average rate of 1.7% per year, about as fast as the average for all occupations in B.C. through to 2008, according to the Canadian Occupational Projections System (COPS). This is a very small occupational group, and the total number of job openings between 1998 and 2008 is estimated at only 20, or an average of 2 openings per year. Almost all are expected to be due to population and economic growth. There will be few openings as a result of turnover, as this is a fairly stable occupation.

Industry sources provide a more optimistic employment growth rate for denturists in B.C. than the COPS does. They estimate that between 1998 and 2008 a total of 50 openings will be available, both to replace those who retire and to meet new demand. These convert into an average of 5 openings per year.

The main factor underlying the employment growth projected by the COPS is population growth and particularly the aging of the population as many boomers start entering their late middle ages. The older generation is more likely to require dentures.

Industry sources also believe that there will continue to be steady demand for denturists' services as their scope of practice expands. Denturists are expected to have their scope of practice expanded starting in the year 2000 so that they will be able to make partial dentures as well as make dentures that fit over implants. These expansions should allow denturists to attract some business previously available only in a dental technicians' laboratory.

On the negative side, the overall dental health of the population has improved substantially. The growing public awareness of preventive dental care and more frequent use of dental hygiene services mean that people will be able to keep their teeth healthy longer. As a result, full dentures will be a lot less common in the future, as most people will need only a bridge or a crown.

As the majority of denture clinics and laboratories concentrate in populated areas, such as the Lower Mainland, competition for business is intense, especially for those new to the occupation or new to the province. Those who are looking for jobs or business opportunities may find more success in rural areas, particularly in Northern B.C.

Additional Information

Vancouver Community College
http://www.vcc.bc.ca/catalogue/47_pro.htm

Related Occupations

- dental assistants (3411)
- dental technicians (3220)
- dental hygienists and dental therapists (3222)
- dentists (3113)

Skills necessary in this field are a high degree of manual dexterity, good vision and an ability to recognize very fine colour shadings.

Dental Hygienists and Dental Therapists

NOC 3222

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	1,280	1,660	2,200

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
540	40	580

Annual Growth 1998-2008	2.9%

Main Industries of Employment

Physicians, and Health Practitioners and Medical Labs	97%
Provincial and Territorial Administration	1%
Furniture Manufacturing	1%

Employment by Region

Lower Mainland	54%
Vancouver Island	18%
Northern B.C.	10%
Okanagan/Kootenay	18%
Self-employment	5%

Nature of the Work

Dental hygienists provide dental hygiene treatment. They also educate the public on the prevention of diseases and disorders of the teeth and mouth, as well as dentistry-related disorders of the head and neck. They are employed in dentists' offices, hospitals, clinics, educational institutions, government agencies and private industry.

Dental therapists carry out limited dental services related to the prevention and treatment of diseases and disorders of the teeth and mouth. They are employees of the federal government and provide services only in First Nations and Inuit communities.

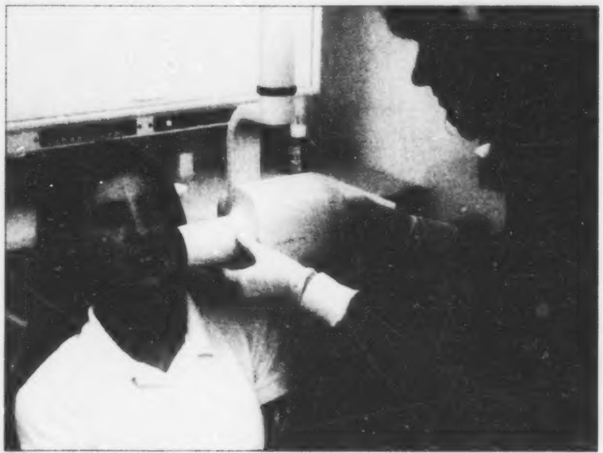
Main Duties

Dental hygienists in a dental practice may examine patients, collect their health history and consult with dentists after coming up with an initial dental assessment. They can perform any of the duties performed by certified dental assistants (NOC 3411), such as the application of fluoride treatment.

In addition, under the direction of a dentist, dental hygienists in a general practice may also remove deposits from the teeth, clean and stimulate the gums to prevent gum disease or desensitize hypersensitive teeth. In a specialist's practice, they may place or remove temporary restorations and re-contour existing restorations. They may also apply periodontal dressings and do root planing. After approved training and under the direct supervision of a dentist, dental hygienists may administer local anesthetics.

Dental hygienists carry a much broader scope of responsibilities than in the past. They are dental health care educators, who instruct patients regarding oral hygiene procedures and promote community dental health programs.

Dental therapists provide limited dental services in First Nations and Inuit communities where no dentists are available. They conduct dental assessments in order to consult with a dentist, take impressions of the teeth and take X-rays. Dental therapists also can fill cavities, extract teeth and replace portions of tooth crowns. They can remove stains and deposits from teeth and apply fluoride treatment. Another important role is to teach patients and the public proper oral hygiene procedures.



©Stone/Vancouver

Example Titles

- dental hygienist
- dental therapist

Education and Training

Dental hygienists are required to complete a two-year college program in dental hygiene. Registration and licensing by the College of Dental Hygienists of British Columbia is required prior to employment and applicants must satisfactorily complete the National Dental Hygiene Certification Board Examination, written after educational requirements have been met.

Dental Hygiene programs are offered at Camosun College, College of New Caledonia and Vancouver Community College. Graduates are eligible to be licensed as Registered Dental Hygienists (RDH). Entrance requirements for dental hygiene programs include completion of one year of university in the areas of biology, chemistry, English and psychology courses, as well as first aid training. Admission requirements also include a criminal record check and evidence of current immunization. Admission is competitive, and related work or volunteer experience as well as additional education may strengthen an application. If applicants are considering dental hygiene education beyond the diploma level, they will need to ensure that the specific chemistry and biology courses they take can be transferred into a bachelor's degree program within the University of British Columbia's dentistry faculty (Bachelor of Dental Science, BDSc).

Dental therapists are trained by the National School of Dental Therapy in Prince Albert, Saskatchewan. Applicants must have grade 12 and are expected to have high school English and biology. This two-year (approximately 2245 hours) dental therapy program prepares individuals for a health career. Applicants must also complete certain health protection requirements, such as providing documentary proof of a current tuberculin test and/or negative chest X-ray and current immunization against rubella, tetanus, polio and hepatitis B.

People who want to become dental hygienists and therapists should have an aptitude for science, enjoy working with others and be able to deal with people who may be under stress. Personal cleanliness and good health are also important. Interpersonal communication skills, basic analytical skills, knowledge of new technology in relation to the field and adaptability are also important. Dental hygienists must have manual dexterity because they use various dental instruments with little room for error. Because dental therapists work in remote areas they need to be comfortable with travelling, self-sufficient and able to establish relationships quickly with a wide range of people, especially children. An ability to communicate in several languages, especially First Nations languages, is an asset.

Working Conditions

Dental hygienists work in clean, well-lit offices in either dental practices or research environments. While a dental hygienist with an educational institution may have a regular 40 hour week, working Monday to Friday, those in private practice have flexible schedules. Many dentists require that hygienists work two or three days a week. Dental hygienists may work part time, evenings and weekends, or they may work in a couple of dentists' offices in order to have full-time, full-year employment.

Dental therapists also work in a clean, well-lit environment. However, in rural and remote communities they must travel extensively to visit and treat patients. The work also is physically demanding, as they need to carry heavy equipment and materials for treatment.

While the work for dental hygienists is generally light and comfortable, safety guidelines need to be strictly followed. Dental hygienists and dental therapists must follow proper radiological procedures when taking X-rays and comply with aseptic (sterile) techniques. They wear safety glasses, masks and gloves to protect themselves from infectious diseases.

The average annual earnings for dental hygienists and therapists in B.C. were $38,000 in 1995. Full-time, full-year workers earned on average $50,600, higher than the provincial average of $39,400 for full year, full time work. According to a recent graduate survey, entry-level salaries averaged about $3,550 per month for full-time work. This means that recent college graduates employed in this occupation could earn about $42,600 a year for full-time, full-year work.

Dental hygienists and dental therapists are a small occupational group. Employment in 1998 was estimated at 1,660, up from 1,280 in 1990. The majority of these workers are dental hygienists, and it is estimated that there are fewer than 10 dental therapists in B.C. As most dental hygienists work at dentists' offices and dental therapists are government employees, they are generally not self-employed. Part-time employment is common (39%), especially among dental hygienists. The all-occupation rate for part-time employment in B.C. is 26%.

The unemployment rate for dental hygienists and dental therapists is low. This reflects steady demand for dental hygiene services. It also reflects the fact that many dental hygienists can arrange continuing employment by working part time or for more than one dental office. Dental hygiene work is not greatly affected by business conditions or seasonal fluctuations.

Dental hygienists are mainly employed in dentists' offices and in dental health services (97%). Dental therapists work for the federal government. Dental hygienists are located across the province in almost identical proportions to the overall provincial workforce distribution. Dental therapists mainly work in Northern B.C.

This occupational group is dominated by women (96%). Women's share in this occupational group has increased over the past decade. The average age of women (35) in this occupational group is slightly lower than the average of men (39). In comparison, the average age of the workforce in B.C. is 38.

Employment Prospects

Employment growth for *dental hygienists* and *dental therapists* is projected to be at an average rate of 2.9% per year, much faster than the average for all occupations in B.C. through to 2008, according to the Canadian Occupational Projections System (COPS). This is a small occupational group, and the total number of job openings between 1998 and 2008 is estimated at 580, or an average of close to 60 openings per year. Over 90% of total openings are expected to be due to population growth, and the remaining openings will be to replace retiring workers. There may not be many additional openings as a result of turnover, as these are fairly stable occupations.

Industry sources suggest that *dental hygienists* experienced substantial employment growth over the past decade, particularly in urban centres and populated communities, such as the Lower Mainland and the Okanagan region. They suggest that there is a surplus of dental hygienists in some of these areas. However, they also suggest that currently there is some shortage of dental hygienists in rural and remote areas, such as in Northern B.C. Industry sources also believe that replacement of those who retire will probably generate more opportunities than the COPS projections suggest.

Several factors affect the demand for dental hygienists. The potential demand is a result of the increase in population, an aging population and the increasing awareness of preventive dental care. More and more people recognize the connections between good oral hygiene habits and keeping their natural teeth healthy longer.

Although some dentists continue to perform dental hygiene work, many are increasingly hiring dental hygienists to perform preventive dental care, while they devote more time to more restorative procedures.

In addition to working in the traditional dentists' offices, industry sources predict that in the near future more dental hygienists will set up their own dental hygiene clinics or provide mobile dental hygiene services. There will also be growing employment opportunities for dental hygienists to provide services in long term care facilities.

Dental therapists follow a much different career path from dental hygienists. Dental therapists are the primary dental caregivers in many First Nations communities in B.C. The training they receive is designed to be applied more independently in rural areas and is not designed to prepare them for work at dentists' offices. As First Nations population continues to grow, so will their demand for preventive and basic dental care. On the other hand, dental therapists are a very small sub-group of professionals within this occupational group and are strictly government employees. Consequently openings are likely to be few in total.

Additional Information

College of Dental Surgeons of B.C. http://www.cdsbc.org

Canadian Dental Hygienists Association http://www.cdha.ca

College of Dental Hygienists of B.C. http://www.cdhbc.com

Related Occupations

- dental assistants (3411)
- dental technicians and laboratory bench workers (3220)
- dentists (3113)
- denturists (3221)

While the work for dental hygienists is generally light and comfortable, safety guidelines need to be strictly followed. Dental hygienists and dental therapists must follow proper radiological procedures when taking X-rays and comply with aseptic (sterile) techniques.

Opticians

NOC 3231

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	740	1,050	1,290

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
240	380	620

Annual Growth 1998-2008 2.1%

Main Industries of Employment

Physicians, and Health Practitioners and Medical Labs	50%
Retail Trade	46%
Other Manufacturing	3%

Employment by Region

Lower Mainland	54%
Vancouver Island	14%
Northern B.C.	11%
Okanagan/Kootenay	21%

Self-employment 14%

Nature of the Work

Opticians or *dispensing opticians* fit eyeglasses and contact lenses, following prescriptions written by ophthalmologists or optometrists (these occupations are profiled in NOC 3111 and NOC 3121). They help customers select appropriate frames, order the necessary ophthalmic laboratory work and adjust the finished eyeglasses.

Opticians are employed in optical retail outlets or other establishments with optical dispensing departments. They may also be self-employed. Student opticians and opticians who are managers of optical retail outlets are included in this group.

Main Duties

Unlike optometrists or ophthalmologists, *opticians* do not examine the eyes or vision. Instead, they read the prescription to check for completeness and to obtain lens specifications. They measure the customer's eye curvature, distance between pupils and width of the bridge of nose using a keratometer and other optical measuring devices.

Opticians also give advice to customers on frames and lens types. They help to select frames or types of lenses to meet the optical and vocational needs of the customer.

Then opticians order the prescription from an optical laboratory. If the optician has his or her own laboratory, he or she also manufactures the glasses.

When the eyeglasses are ready, opticians have to make sure that the eyeglasses are correct and adjust the eyeglasses to fit the customer.

Opticians also help to arrange for grinding and polishing contact lenses. They help customers fit contact lenses and instruct them on how to insert, remove, and clean lenses.

Those opticians who manage retail outlets also have business responsibilities that include looking after administration, finance, inventory and sales promotion.

©Stone/Vancouver

Example Titles

- contact lens fitter
- contact lens technician
- dispensing optician
- ophthalmic dispenser

Education and Training

Licensing is a requirement in order to practise as an *optician* or *contact lens fitter* in B.C. Graduates of a suitable program are eligible to apply to take the provincial registration exam(s) through the College of Opticians of B.C. and, if successful, apply for a licence through the College.

There are currently two methods of training for dispensing opticians. The first is to complete the Dispensing Optician Program offered by Douglas College, which is the only program of its kind in Western Canada. This full-time program offers a one-year certificate in Dispensing Opticianry - Eyeglasses and a two-year diploma in Dispensing Opticianry - Contact Lenses. Graduates of both options are eligible to write the dispensing registration exam(s). Admission requirements for both programs include high school graduation or equivalent, a minimum designation of the Douglas College Writing Assessment or equivalent, attendance at a tour/information session of a retail optical outlet that provides an overview of all aspects of the field, two reference letters and a criminal record search that satisfies program requirements. Applicants may be required to attend a personal interview.

The second method of becoming a dispensing optician is to work in a retail optical outlet for at least three months and apply to take a two-year dispensing optician correspondence, or home study, course offered by the Northern Alberta Institute of Technology through the Health Sciences Program in Continuing Education. This program is offered in cooperation with the Opticians' Association of Canada. To be eligible for the Eye Glasses Dispensing Independent Study Program, applicants must have a high school diploma and be employed with a licensed optician. Suggested prerequisites are an ability to solve problems at a grade 12 mathematics level and some knowledge of anatomy. A two-year Dispensing Contact Lenses Program is also offered through this study mode and requires the Dispensing Optician Certificate as a prerequisite. Both courses offer classes and seminars to support self-study.

Because opticians have extensive contact with the public, excellent interpersonal communication skills and tactfulness are required. Workers in this occupation must have basic analytic skills, knowledge of computers and an ability to measure according to specifications as well as a willingness to upgrade their skills continually.

Working Conditions

Opticians work indoors in attractive, well-lit and well-ventilated surroundings. They may work in small stores or in large optical chain stores with several opticians.

Opticians serve customers directly. They show optical products and therefore spend much time on their feet. Opticians who prepare lenses need to know how to take precautions against potential hazards, such as contact with harmful chemicals and injuries from glass cutting.

Most opticians work a 40 hour week. Depending on the type and location of the business, opticians may work evenings and weekends. The work is comfortable but requires patience, tact and specialized skills.

The 1995 average annual earnings for all opticians in B.C. were $23,200, lower than the provincial average for all occupations ($27,900). Opticians working full time, full year earned an average of $26,000, which is also lower than the provincial average of $39,400. Women earned on average $20,500 in 1995, compared to men who averaged $29,400.

Income levels vary depending on the location of the business and the skills of the optician. While opticians at the entry level may only earn minimum wage, as their skills improve their income goes up as well. For an experienced optician monthly earnings can reach $5,400. If the optician owns or manages a business, his or her income can increase substantially.

This is a small occupational group. Estimated employment in B.C. in 1998 was 1,050, up 44% from 1990. Self-employment (14%) is just below the provincial average of 15%. Part of the reason for this relatively low proportion of self-employment is that starting a retail optical business requires a fair amount of capital.

Some opticians work part time (16%). The all-occupation rate for part-time employment in B.C. is 26%. The unemployment rate for opticians is lower than the provincial average. This suggests a steady demand for the services of opticians. However, as with most retail businesses, employment demand is affected by general business conditions as well as by seasonal fluctuations. Industry sources indicate that part-time employment and self-employment as well as employment on a contract basis are likely to increase in the future.

Opticians are mainly employed in physicians' offices, health care practices and medical laboratories (50%). They are also employed in the retail industry (46%). They are located all over the province with slight variations compared to the overall provincial workforce distribution. The Lower Mainland has the majority of opticians (54%), but the Okanagan-Kootenay region has a slightly higher than average representation (21%).

The number of women in this occupation continues to grow. Between 1971 and 1986 women's representation in this occupation tripled. Between 1986 and 1991 their share went up by 9%, and women accounted for 57% of B.C.'s opticians. By 1998 women accounted for 71% of the workers in this occupation. The average age for all opticians is 38, the same as the workforce average. Almost 60% of these workers are between the ages of 25 to 44. There is also a larger than average proportion of men over the age of 45 in this occupation.

Employment Prospects

Employment growth for opticians is projected to be at an average rate of 2.1% per year, faster than the average for all occupations in B.C. through to 2008, according to the Canadian Occupational Projections System (COPS). This is a small occupational group, and average employment growth will only result in a small number of new jobs. The total number of job openings between 1998 and 2008 is estimated at 620, or an average of only 60 openings per year. Close to 40% of the total will be openings due to population and economic growth, and the other 60% will be the result of retirements. There may be additional employment opportunities due to turnover that are not captured by COPS.

Industry sources agree that opticians will experience an average employment growth rate. They also suggest that currently there is a shortage of opticians across the province, especially in northern B.C.

Several factors affect the demand for *opticians*. The potential growth predicted by COPS is a result of the increase in population, the aging of the population and the increasing demand for preventive and corrective vision care.

Population growth brings increased demand. The maturing of the baby boom generation and the rapid growth of the elderly population will be the main driving forces for employment growth. Those over 45 years of age visit optometrists (NOC 3121) and ophthalmologists (in NOC 3111, Special Physicians) more often because of the onset of vision problems in middle age. They may begin using corrective lenses and therefore require the services of opticians.

People are also more aware of preventive vision care than in the past. It is not only people with vision problems who will need the help of opticians. Those without specific problems may also use optical products, such as sunglasses. The availability of such products as special lens treatments, photochromic lenses (glasses that darken in sunlight), tinted lenses, bifocal extended wear lenses and disposable contact lenses also increases the demand for optical services.

In addition, industry sources suggest that the North America Free Trade Agreement (NAFTA), in allowing the mobility of professional licensees to work across the border, has provided opticians with more access to out-of-province employment opportunities.

New technology, such as laser surgery, may have a negative impact on the demand for opticians' services. Laser surgery may reduce the need for eyeglasses for some people with short-sightedness. However, it is possible that age-related corrective treatment provided by opticians may more than counter the reduced demand for lenses resulting from such procedures as laser surgery.

Opticians face continued competition from optometrists who also dispense eyeglasses and contact lenses. To maintain their market share, those opticians who are also business owners will need to be creative in order to attract and maintain their potential and existing clientele.

With experience, staff opticians may progress to store management positions or even start their own businesses. Those people interested in careers where similarly delicate work is involved can train for such occupations as artificial eye makers, ophthalmic laboratory technicians, camera repairers and watch repairers.

Additional Information

Opticians' Association of Canada *http://www.opticians.ca*

Douglas College Dispensing Optician Program
http://www.douglas.bc.ca/calhtm/programs/pdop.htm

Northern Alberta Institute of Technology Optical Programs
http://www.nait.ab.ca/coned/newcourses/default.htm

Related Occupations

- ophthalmologist (in 3111 specialist physicians)
- optometrist (3121)
- ophthalmic technician (in 3235 other technical occupations in therapy and assessment)
- managers of optical retail outlets or of optical dispensing departments other than opticians (in 01/09 middle and other management)

Midwives and Practitioners of Natural Healing

NOC 3232

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	490	700	900

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
200	260	460

Annual Growth 1998-2008 2.5%

Main Industries of Employment

Physicians, and Health Practitioners and Medical Labs	77%
Retail Trade	8%
Personal and Household Services	7%

Employment by Region

Lower Mainland	62%
Vancouver Island	25%
Northern B.C.	0%
Okanagan/Kootenay	11%

Self-employment 76%

Nature of the Work

This is a very small occupational group that covers *midwives* who provide care and advice to women during pregnancy, labour and the postnatal period. It also includes practitioners who provide alternative methods of health care. These practitioners include *acupuncturists, Chinese medicine practitioners, herbalists, homeopaths, reflexologists, rolfers, shamans* and *shiatsu therapists*.

Midwives are employed by the B.C. Women's Hospital, and they also practise in homes and in the community. Most practitioners of natural healing are in private practice, but they may also be employed by health clinics or health food stores.

Main Duties

Midwives carry out examinations necessary to establish and monitor normal pregnancies and advise pregnant women as soon as any pregnancy at risk is detected. They counsel and educate women concerning diet, exercise and other prenatal health practices. During labour, midwives monitor the condition of the mother and the baby and guide the birthing process. When an emergency arises, they take appropriate measures and arrange for contact with physicians (obstetricians). They also examine and care for newborn babies and educate mothers on health care.

In the community, midwives may conduct classes on pregnancy and childbirth as well as family planning and other related topics.

Acupuncturists and *Chinese medicine practitioners* diagnose diseases, physiological disorders and injuries of the patient. While acupuncturists treat patients by using acupuncture needles or through the use of laser and electric stimulation, Chinese medicine practitioners may use acupuncture, herbs or other medicine to treat patients. Alternatively, they may provide dietary suggestions.

Homeopaths diagnose illness and treat patients. In some cases, they give the patient, either orally or by injection, a minute amount of a herbal or chemical extract that, in a healthy patient, would reproduce or mimic the disease's symptoms. However, when a patient is unwell, this diluted substance acts as a treatment to cure or relieve the disease. Alternatively, they may suggest lifestyle change.

Herbalists provide advice on the use of herbs to treat conditions such as arthritis, rheumatism, asthma, skin problems and stomach ailments. They may also sell products that treat the above conditions.

Reflexologists and *shiatsu therapists* apply finger pressure to specific spots on the clients' hands or feet to help clients relax and to relieve clients' ailments.

Rolfers systematically manipulate various parts of the body, such as the legs and shoulders, in order to realign the structure of the body and reduce chronic pain or stress.

Many of these practitioners also own their practice. For them, looking after the finance and administration of the business are also part of their responsibilities.

Example Titles

- aromatherapist
- acupuncturist
- Chinese medical practitioner
- herbalist
- homeopath
- midwife
- reflexologist
- rolfer
- shiatsu therapist

©Stone/Vancouver

Education and Training

To practise as a *midwife* in British Columbia, individuals must be registered with the College of Midwives of British Columbia (CMBC). To become a registered midwife, applicants must complete a midwifery education program or its equivalent, acceptable to the Registration Committee. Midwives must also have clinical experience consisting of attendance at a minimum of 60 births within the last five years, of which at least 40 births have been as the principal midwife, and successfully complete the provincial examination administered by CMBC. Finally, registered midwives must hold current certificates in neonatal resuscitation and cardiopulmonary resuscitation from acceptable programs.

The only English-speaking midwifery program that is currently available in Canada is jointly offered by McMaster University (Hamilton), Ryerson Polytechnic University in Toronto and Laurentian University in Sudbury. This four-year program leads to a Bachelor of Health Sciences (BHSc) in Midwifery. The curriculum balances theoretical and clinical courses. Students are also assigned to a midwifery practice and preceptor for a period of clinical practice. Admission requirements include grade 12 diploma, English, biology or chemistry and a social science course. These courses can be taken at high school or through a university or college. Check with a counsellor from McMaster, Laurentian or Ryerson Polytechnic University to determine eligibility. Admissions are highly competitive. Thus having completed all three course areas does not guarantee entry into the program.

The Seattle Midwifery School (SMS) has a 27-month program that trains individuals in the physical, emotional, sexual, psychosocial and political aspects of midwifery care. Admission requirements to this program include proficiency in English, a high school diploma or equivalent, the completion of the Labour Support course (offered by SMS Extension Education Program) and one year of college, including courses in English, human anatomy and physiology, math, microbiology, a social science course and biology.

Midwifery has been described as a lifestyle as well as a career. To be successful, midwives need to be able to accept people non-judgementally, with genuine concern and compassion. They need to exhibit an emotional stability that instills confidence in others, especially during emergency situations. They also require good organizational skills, good health and physical stamina, and they should exhibit good judgement in a variety of situations. Midwives must be able to work independently and take responsibility, but they also need to work in collaboration with others as necessary. As the role of midwife often involves being active in the community, those who enjoy dealing with the public will have an advantage.

Acupuncturists require completion of a training program in acupuncture and may also require some university undergraduate studies in science or training in a related health care discipline. Acupuncturists in B.C. will be required to register through the College of Traditional Chinese Medicine and Acupuncturist Practitioners of British Columbia in order to use the title "acupuncturist" starting in June, 2001.

Prospective acupuncturists are advised to contact the College for information regarding training institutions and their educational requirements.

Chinese medical practitioners usually require completion of a program in traditional Chinese medicine, which is available at various private institutes. These institutes are located in Vancouver and Victoria. The programs often require four years of training, depending on the specialties learned, and admission requirements may include applicants having some post secondary education or relevant work experience. Currently Chinese medical practitioners are encouraged to register with the College of Traditional Chinese Medicine and Acupuncturist Practitioners of British Columbia, although it is not yet mandatory to be able to practise.

All other professions in this occupational group (including *therapeutic touch practitioners, herbalists, homeopaths* and *aromatherapists*) usually require the completion of courses or training programs specific to their occupations. Most also require some supervised practical training. No regulatory bodies currently exist for these occupations, therefore there are no standards of practice, and education and training programs may vary greatly.

Practitioners in this group should have compassion and a genuine concern for the welfare of others. They should be emotionally stable, have good communication skills and be able to instill confidence in others. They must be able to work independently.

Working Conditions

Midwives work either at clients' homes or in hospitals. They may travel between homes and hospitals frequently. They are on call 24 hours a day.

Other practitioners of natural healing work in a variety of settings. For example, *acupuncturists, shiatsu therapists, reflexologists* and *rolfers* work in private clinics, while *Chinese medical practitioners* generally have private practices in Chinese medicine stores that they might also own. *Herbalists* may work at health food stores. These natural healing practitioners set their own hours. Usually the hours are flexible, meeting the needs of their clients.

Earnings for practitioners in this group vary greatly depending on the number of clients they serve, the number of years in practice and other factors. The average annual earnings for this occupational group in 1995 were $14,900. Those who worked full time, full year earned $19,000 on average. Full-time, full-year women practitioners earn slightly more than their counterparts who are men. By comparison, the provincial average for all occupations is $27,900, and for full-time, full-year employment it is $39,400.

This is a very small occupational group. Employment was estimated at 700 in 1998, up 43% from 1990. Like other health care practitioners in diagnosis and treatment, self-employment is very common at 76%, which is much higher than the provincial average (15%) for all occupations. Part-time work is also common among this group (38%), especially for women practitioners (56%). The all-occupation rate for part-time employment in B.C. is 26%.

Like other groups of health care practitioners with high rates of self-employment, practitioners in this category have a lower than average unemployment rate. Their work is not greatly affected by economic conditions nor by any seasonal fluctuation.

Practitioners in this occupational group mainly work in private practice, for example, in midwives' offices and acupuncturists' offices (77%). They are also found in retail (8%) and other home and personal services (7%). Most of them are located in the Lower Mainland (62%) and on Vancouver Island (25%). They are underrepresented in the Okanagan-Kootenay and Northern B.C. regions.

Women make up half of the workforce in this occupation. There are only a few young people in this occupational group, and the average age of workers is 45, seven years older than the B.C. all-occupation average. The majority of these workers (72%) are between the ages of 35 to 54, and only a few continue to practise past the usual retirement age.

Employment Prospects

Employment for practitioners in this occupational group is projected to grow at an average rate of 2.5% per year, much faster than the average for all occupations in B.C. through to 2008, according to the Canadian Occupational Projections System (COPS). This occupational group is very small, and the total number of job openings between 1998 and 2008 is estimated at only 460, or an average of 45 openings per year. Close to half of the total openings (43%) are expected to be the result of population and economic growth, and the rest will be to replace those who retire.

Industry sources estimate that there were 49 midwives practising in B.C. in 1998. In the Lower Mainland there is currently more demand for services than can be supplied. Industry sources also indicate that there are currently approximately 700 practitioners of acupuncture, some of whom also prescribe herbal remedies and other treatments for their patients. Note that some of these practitioners primarily work in another occupation, for example, managing a traditional herbal store, and practise acupuncture as a side-line. *Midwives* and *acupuncturists* are the only practitioners in this occupational group who are currently regulated in the province. Midwifery is part of the publicly funded health care system, while acupuncture is not covered by the B.C. Medical Service Plan (MSP).

Services provided by practitioners in this occupational group have existed for hundreds of years, suggesting that there continues to be a steady demand. It is expected that demand for these services will continue, and may even accelerate, given that some of these practitioners have taken steps to establish regulatory bodies and licensing procedures, making their services more accessible in hospitals and clinics. Industry sources estimate that the number of midwives will probably double over the next decade.

One factor supporting a promising employment and business opportunity outlook for practitioners in this occupational group is a more culturally diversified provincial population. Another important factor is the growing public interest in alternative methods of preventive care and healing. People are more willing to try combinations of conventional medicine and alternative methods to achieve both physical and mental health.

Even though demand for these alternative medical services will be steady, the absolute number of openings for each of the sub-groups will remain small because of the size of the sub-groups. It should also be emphasized that three-quarters of those in this occupational group are self-employed. Those interested in these occupations should be prepared to develop business management skills. Individuals interested in specific careers should consult local practitioners before making training decisions.

Additional Information

For *midwifery*
College of Midwives of B.C. (CMBC)
http://www.cmbc.bc.ca

Seattle Midwifery School http://www.seattlemidwifery.org

McMaster University Midwifery Education Programme
http://www-fhs.mcmaster.ca/midwifery

For *acupuncture*
College of Traditional Chinese Medicine and Acupuncturist Practitioners of B.C. http://www.acupuncturetcm.com

Related Occupations

- massage therapist (in 3235 other technical occupations in therapy and assessment)
- naturopath (in 3123 other professional occupations in health diagnosing and treating)
- obstetrician (in 3111 specialist physicians)
- osteopath (in 3123 other professional occupations in health diagnosing and treating)

> ***Services provided by practitioners in this occupational group have existed for hundreds of years, suggesting that there continues to be a steady demand. It is expected that demand for these services will continue, and may even accelerate, given that some of these practitioners have taken steps to establish regulatory bodies and licensing procedures, making their services more accessible in hospitals and clinics.***

Nursing Assistants

NOC 3233

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	2,980	3,300	3,720

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
420	1,120	1,540

Annual Growth 1998-2008 1.2%

Main Industries of Employment

Hospitals	79%
Other Health and Social Services	16%
Physicians, and Health Practitioners and Medical Labs	4%

Employment by Region

Lower Mainland	48%
Vancouver Island	24%
Northern B.C.	9%
Okanagan/Kootenay	18%

Self-employment 1%

Nature of the Work

This occupational group is primarily made up of *licensed practical nurses* but also includes *operating room technicians*. They provide nursing care for patients under the direction of physicians, nurses, and other health team members. In other provinces this occupational group may be referred to as licensed nursing assistants, registered nursing assistants, certified nursing assistants or registered practical nurses.

Licensed practical nurses (LPNs) are employed in hospitals, nursing homes, rehabilitation centres, doctors' offices, clinics, occupational health units, community nursing services and private homes. Those working in B.C. must have a licence. LPNs assist registered nurses and psychiatric nurses (Nurses are profiled in NOC 3152) in assessing, planning, implementing and evaluating nursing care. Although they work under the direction of physicians and nurses, they also make nursing judgements, provide required care for assigned patients and are responsible for their own nursing actions.

Operating room technicians mainly work in hospitals, and a few are employed in the offices of physicians and dentists who perform minor surgery.

Main Duties

Most *licensed practical nurses* provide basic bedside care. They take vital signs, such as blood pressure, temperature, pulse and respirations. They distribute medication to patients, treat bedsores, prepare and give injections and enemas, apply aseptic dressings, insert catheters and perform other personal treatment. They help patients with bathing, dressing and personal hygiene. They feed them, keep them comfortable and care for their emotional needs.

Outside the ward, licensed practical nurses observe patients and report adverse reactions to medications or treatments. They may collect samples from patients for testing and perform routine laboratory tests.

Licensed practical nurses in nursing homes provide routine bedside care. They also help evaluate residents' needs, develop care plans, and supervise nursing aides (Nurse Aides are profiled in NOC 3413). In doctors' offices and clinics they may teach family members simple nursing tasks. In this setting, they may also perform some clerical duties.

With additional training, nursing assistants may become *operating room technicians*. Operating room technicians assist in operations. Before the operation, they help set up the operating room with surgical instruments, equipment, sterile linens and fluids. They also prepare patients for surgery by washing, shaving and sterilizing their operative areas. They transport and position patients properly in the operating room. They also observe patients' vital signs and check charts. During operations, they pass instruments and other sterile supplies to surgeons, hold retractors, cut sutures and help count sponges, needles, supplies and instruments. They help prepare and label specimens taken for laboratory analysis and may help apply dressings. They may also operate sterilizers, lights or suction machines and help operate diagnostic equipment. After operations they help transfer patients to the recovery rooms and clean and restock the operating room.

Example Titles

- licensed practical nurse
- operating room technician
- registered nursing assistant (in provinces and territories other than B.C.)

Education and Training

To work as a *licensed practical nurse* in B.C., completion of a practical nursing program or other approved program is required, followed by licensing with the College of Licensed Practical Nurses of B.C. Graduates of a practical nursing program are eligible to write the Canadian National Testing Service (CNATS) examinations, and to apply for licensing as a Licensed Practical Nurse (LPN).

College of the Rockies, Okanagan University College, Malaspina University College and Vancouver Community College offer twelve-month Practical Nursing certificates. Applicants must have grade 12 or equivalent, English and biology 12 and a valid CPR Level C certificate and must undergo a criminal record check and provide evidence of good health and current immunization.

The Access to Practical Nursing Program is offered at Vancouver Community College (VCC). It is a 28-week (two days per week and includes a three week practicum) program for applicants who have already completed a Resident Care Attendant (RCA) Certificate program, or a Combined Home Support/Resident Care Attendant (HSA/RCA) Certificate program. Graduates of this program will be able to enter the third semester of the Practical Nursing Certificate offered at VCC.

Douglas College offers a Nursing (RPN and LPN) Access I and II Program, which takes approximately two years. This program is designed for licensed practical nurses (Access I) and registered psychiatric nurses (Access II) who wish to receive credit for previous nursing education and experience. Applicants must be registered as either a licensed practical nurse or a registered psychiatric nurse to be eligible.

The Open University offers a self-paced Practical Nurse Refresher Program to help practical nurses update their nursing knowledge and return to active nursing practice. It is available to practical nurses who are required by the College of Licensed Practical Nurses of B.C. to take a refresher program.

An LPN who wishes to work as an *operating room technician* must complete special training in this area. There are currently no educational programs for operating room technicians in B.C., no regulatory bodies and no licensing requirements. The nearest program is the Operating Room Nursing and Techniques/Licensed Practical Nurse Program at the Wascana Institute, Saskatchewan Institute of Applied Science and Technology. This program includes six courses and one 400-hour practicum expanding on knowledge accumulated during a minimum of six months' practical LPN experience, and confers a certificate. Each course must be completed within 16 weeks of the start date, and the entire program must be completed within three years.

These occupations require physical stamina as well as sensitivity, patience, understanding, emotional stability and dependability. Workers in these occupations should be responsible and have good judgement. They should also have good communication and interpersonal skills and enjoy caring for people of all ages. They must be able to work as part of a team, follow direction and work under close supervision and must be willing to perform repetitive, routine tasks.

Working Conditions

Nursing assistants work in a wide variety of health care settings. They may be found in hospitals, long term care facilities, psychiatric facilities, individuals' homes and educational institutions. They usually work a 36 to 40 hour week, although part-time and on-call work is common. Shift work during evenings and weekends is also common among *licensed practical nurses*, though it is less common with *operating room technicians*. They must often stand and walk for long periods of time in order to help move patients or perform other duties. They have to face potential hazards, such as infectious diseases, toxic chemicals and back injuries. They also have to deal with the emotional stress that may come from working with patients and their families.

The 1995 average earnings for all nursing assistants in B.C. were $26,100. The earnings of those who were employed full time, full year averaged $31,700, with men averaging $34,200 and women averaging $31,400. Full-time, full-year earnings for this occupation are lower than the average for all occupations in B.C. ($39,400).

Earnings vary depending on the worker's skills, the number of years worked, bargaining power and other factors. According to industry sources, an entry-level nursing assistant working in a hospital and belonging to a union may earn about $18.63/hour, (about $2,600 per month for full-time work), while an experienced nursing assistant earns about $19.03/hour (about $2,700 per month for full-time work)). Those in non-union environments may earn less. A recent graduate survey found that college graduates who found employment in this occupation earned an average $2,280 a month for full-time work. This would translate into about $27,400 in annual earnings for full-time, full-year work.

Nursing assistants are a medium-sized occupational group. Employment for 1998 was estimated at 3,300 in B.C., up from 2,980 in 1990. Self-employment is rare in this occupation (less than 1%). By comparison, the rate of self-employment across all occupations in B.C. is 15%. However, there are more part-time workers (30%) than the average 26% for the B.C. workforce, and the percentage is increasing. The unemployment rate for this group is lower than the provincial average for all occupations. According to industry sources, many of these licensed practical nurses find employment as care aides or clerks or are working fewer hours. The work is not affected by general economic conditions nor by seasonal fluctuations. However, employment levels tend to fluctuate with the overall level of other nursing personnel available. Licensed practical nurses may also find that employment levels fluctuate depending on the level of funding provided to health care by the provincial and federal governments.

Nursing assistants are mainly employed by hospitals (79%) and other health and social services (16%). In terms of geographic distribution, the largest proportion of workers is located in the Lower Mainland (48%), a share that is lower than this area's overall workforce share of 57%. Vancouver Island (24%) and the Okanagan/Kootenay region (18%) have a greater than proportional share compared to the overall B.C. workforce distribution.

Like other nursing occupations, this occupation is dominated by women (91%). There are significantly more nursing assistants between the ages of 45 and 64 (45%) than the all-occupation average (30%). The average age of this group is 43, five years higher than the provincial average.

Employment Prospects

Health care in B.C. and Canada as a whole has gone through considerable change over the last few years, and more change is expected. Population growth, an aging population and technological advancement in diagnosis and treatment are contributing to increasing demands for health services. We are currently facing worker shortages in some health occupations and have waiting lists for many health services. This pressure is expected to continue in the future and is leading governments to explore alternative options to finance and deliver high quality health care. New approaches to medical service delivery are being considered in conjunction with other policy changes. There may be increased use of the Internet to provide information directly to health consumers as well as to support the delivery of services by health providers. Any of these changes has the potential to influence employment needs. The employment projections in the summary table and following paragraphs, unless otherwise stated, are from the Canadian Occupational Projection System (COPS) demand model. The COPS model draws on traditional health delivery patterns, including the historic relationship between population growth and demand for nursing services. As a result, COPS may not capture all the impacts of changing technology, delivery models and health policy on the provision of health care services in B.C. The COPS growth rate projected reflects population growth and the provincial budgetary constraints of the past few years.

This is a medium-sized occupational group, with employment estimated at 3,300 workers in B.C. in 1998. Almost all workers in this group are employed as *licensed practical nurses*. Fewer than 100 are *operating room technicians*. The Canadian Occupational Projection System (COPS) projects employment in this group to grow more slowly than average at an annual rate of 1.2%. A total of 1,540 positions are projected to become available from 1998 to 2008. As a result of an aging workforce, particularly for licensed practical nurses (LPNs), about 73% of these openings are projected to come from retirements. The remainder will come from growth in the number of new positions. Given their current age structure, retirements of LPNs expected between 1998 and 2008 will be growing in number each year. As well, additional openings will occur as a result of LPNs leaving the occupation for work in other occupations.

A number of industry sources indicate that there is currently a shortage of registered LPNs available for the number of LPN employment positions in B.C. This shortage is expected to continue throughout the forecast period. As a result, employers are reviewing their ability to recruit and retain LPNs. For example, the trend through the 1990s was toward increasing the numbers of casual workers, and many new graduates worked on a casual on call basis for a number of years before getting regular status. This is now beginning to change, but not to the degree that it is changing for Registered Nurses (see profile 3152). However, it is likely more employers will seek to create more full-time positions for LPNs as well in an attempt to both recruit and retain them. In addition, employers are creating longer orientation and mentorship programs for new graduates and new employees.

On the other hand, some evidence suggests that there is no shortage of LPNs in an ordinary sense but rather considerable reluctance by qualified and registered LPNs who are working in other nursing-related or non-nursing-related occupations to leave their current jobs (which often may be full time) for an LPN employment opening (which often are casual on call positions). Administrative data on numbers of registered LPNs in B.C. shows only about half of those employed in nursing-related occupations have full-time hours. Only about 60% of qualified and registered LPNs are actually employed in a licensed practical nurse position, most of the remaining 40% are in other related nursing or non-nursing-related employment. This issue of shortage is considerably more complex due to a number of factors. For example, health care restructuring in the first half of the

1990s saw layoffs of LPNs at hospitals, and there was also a trend among some employers in the late 1980s and early 1990s to substitute registered nurses for LPNs. A number of LPNs left the occupation, and others moved into nursing-related positions.

The majority of LPN programs at post secondary institutions have had many more applicants than seats available in recent years. Many stakeholders, including employers, unions and nursing associations, have lobbied government to expand the number of positions for nursing training in B.C., including LPN training. Consequently the B.C. government increased funding to provide for an additional 400 nursing seats in post secondary institutions in B.C. starting in the 2000/2001 academic year.

There will be many factors influencing the demand for LPNs over the next few years. The population is growing and aging, and some industry sources believe that more health care resources, including practical nursing care, will be required as a result. Other industry sources dispute such tight connections between aging and increased medical care needs. However, an aging population and the movement of the large group of baby boomers into their senior years, even if they have a decreased relative use of acute care needs, does suggest expansion in home care needs for LPNs.

The role of LPNs and other health care professionals may expand as governments consider alternatives to help contain the expansion of health care costs. One approach suggested is for primary care to be delivered by multidisciplinary teams consisting of doctors, registered nurses, LPNs, nursing aides and other health professionals. One option proposed would be to expand the scope of practice of LPNs who, under more limited supervision of registered nurses, would provide patient care in situations where nurses' skills are not required. Such a change in the role of LPNs would probably increase their employment opportunities within institutional settings.

Technological changes and government policies can act to reduce potential growth in nursing opportunities and may also change how and where nursing care is provided. For example, technological innovations in patient care, which permit a greater number of medical problems to be treated with fewer days in the hospital, have an impact on hospital use and the demand for nurses and LPNs. The number of patients who stay overnight in hospitals is expected to decrease as more procedures can be performed on an outpatient basis. Many sophisticated procedures that used to be available only in hospitals can now be performed in physicians' offices, at clinics and even in emergency medical centres. Further, increasingly complex treatment appliances can now be brought into patients' homes for use in treatment and therapy. While these technological changes do mean that more patients can be treated with the support of fewer nursing staff, they are also increasing the level of acute patient care in hospitals. It is increasingly the more seriously ill patients who are treated in hospitals. This may in turn increase the pressures for more nursing resources in hospitals, though the need may be for more registered nurses, with relatively less increases in the need for LPNs within hospitals.

The provincial government's fiscal constraints are limiting growth in funding available for health care. Health policies encourage the use of lower cost health care and of the technology now available. There is interest in reorienting the health care system away from reliance on hospitals and institutional care and toward programs in workplaces, schools and neighbourhoods to support the delivery of health services closer to patients' homes. These policies will influence the demand for LPNs.

While it is challenging to predict clearly the growth in employment in LPNs, the large number of openings required due to retirements of existing LPNs will clearly offer considerable opportunities for new workers choosing to enter this occupation.

The employment outlook for *operating room technicians* should remain stable. It is a very small occupation within the nursing assistant group, with less than 100 such workers currently employed by major hospitals in B.C.

Individuals interested in this occupational group might want to consult local sources (for example, hospitals and other health care facilities as well as colleges that offer training) for up-to-date information before making a career or training decision.

Additional Information

For *licensed practical nurses*
College of Licensed Practical Nurses of British Columbia
http://www.clpn.bc.ca

For *operating room technicians*
Operating Room Nurses Association of Canada
http://www.ornac.ca

Related Occupations

- nurses (3152)
- nurse aides and orderlies (3413)
- ward clerk (in 1441 administrative clerks)

These occupations require physical stamina as well as sensitivity, patience, understanding, emotional stability and dependability. Workers in these occupations should be responsible and have good judgement. They should also have goodcommunication and interpersonal skills and enjoy caring for people of all ages.

Ambulance Attendants and Other Paramedical Occupations

NOC 3234

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	2,800	3,480	3,700

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
220	1,160	1,380

Annual Growth 1998-2008	0.6%
Main Industries of Employment	
Other Health and Social Services	43%
Construction	11%
Logging and Forestry	8%
Employment by Region	
Lower Mainland	47%
Vancouver Island	18%
Northern B.C.	18%
Okanagan/Kootenay	17%
Self-employment	3%

Nature of the Work

In B.C. the title for *ambulance attendants*, or *paramedics*, is *emergency medical assistants (EMAs)*. They provide first aid and pre-hospital medical services to minimize disability or loss of life in emergency situations. Emergency medical assistants are skilled in the areas of first aid, general ambulance practices and procedures, basic nursing, patient assessment, specialized diagnostics and treatments.

There are five different levels of emergency medical assistants depending on the amount of training. These are EMA first responder, EMA first aid, EMA 1, EMA 2 and EMA 3. EMA first responders are mostly firefighters or police officers, and providing emergency medical assistance is not their primary duty (they are profiled in NOCs 6261 and 6262, respectively).

Emergency medical assistants are licensed members of the health care team. They work for the B.C. Ambulance Service, which is the sole provider of public ambulance services for the province and is independent of police, fire or hospital agencies.

Other occupations in this occupational group include *first aid attendants*. First aid attendants are designated by employers to provide first aid to workers at workplaces. They hold valid certificates of Occupational First Aid (levels 1, 2 or 3) issued by the Workers' Compensation Board (WCB) of B.C. Providing first aid may not be the primary responsibility of some first aid attendants. Therefore, they may be classified in other profiles that reflect the primary responsibilities of their work.

First aid attendants work for private industrial ambulance services. They are also employed by schools, hospitals and manufacturing firms and in industrial sites, such as sawmills, construction sites, movie production sites and mines.

Main Duties

Emergency medical assistants (EMAs) have three different levels of qualification. They all provide emergency patient care, and the number of medical protocols they are able to perform increases with the training they receive.

All EMAs assess the nature and extent of the patient's injuries or illness and other pre-existing medical conditions. They can then give appropriate emergency care following strict protocols. These duties range from administering basic first aid to more advanced treatment, such as administering intravenous fluids, and using monitors and other complex equipment.

When transporting patients to medical facilities, EMAs may use special equipment for immobilization, such as backboards to secure them, and place them in the ambulance. While one EMA drives, the other monitors the patient's vital signs and gives additional care when needed.

On arriving at the medical facilities, EMAs transfer patients to the emergency room and report their observations and the care they have provided to emergency medical staff, and they may help to administer emergency treatment. EMAs also keep the ambulance and equipment on board clean and ready to serve the next patient.

First aid attendants care for people who are injured or become ill at work. They assess how serious the situation is and what treatment is needed to reduce pain, prevent infection or keep the patient alive until the ambulance arrives. They clean and bandage wounds, give oxygen and keep air passages clear in cases of choking. They make sure the patient does not move in cases of spine or head injuries and keep the patient warm and comfortable. They also keep records of their treatment.

First aid is not always a full-time job. Many first aid attendants combine this work with other skills and responsibilities, such as office work, security of the building or other tasks. Full-time first aid attendants either work at high-risk workplaces or drive industrial ambulances to transport patients from accident scenes to the hospital.

Example Titles

- ambulance attendant
- emergency medical assistant
- paramedic
- first aid attendant
- industrial ambulance driver
- drilling rig medic

Education and Training

In British Columbia, in order to be eligible for employment as an *ambulance attendant*, one must meet several requirements. Applicants must complete grade 12 or equivalent, be at least 19 years of age, have a class 1, 2 or 4 driver's licence and pass medical and physical fitness requirements as well as a criminal record search. Applicants must also have an Occupational First Aid Certificate (Level 3 or equivalent) and an Infant CPR certificate. Experience as a life guard, occupational first aid attendant or ski patrol member is an asset, as is any type of volunteer work involving patient care, use of basic medical equipment and assessment of patient needs.

Most ambulance attendants are hired on a part-time basis and receive on-the-job training to achieve an *Emergency Medical Attendant* (EMA) level 1 and level 2 status. Training is provided by the Paramedic Academy of the Justice Institute of B.C. Applicants for EMA I require completion of the Paramedic Level I (EMA I) program (nine weeks in duration), Level I Driving component, EMA Lifting Examination and must complete successfully the written and practical evaluations. EMA II licensing requires the completion of EMA II (six month program), EMA I, the Level II and III Driving components, the Automobile Extrication and Sidehill Evacuation components and successful completion of several examinations. Re-certification is required every five years. For ambulance attendants to be hired on a full-time basis, they must have an EMA level 2 status. Further advancement is possible with experience and training. At all levels, a licence from the Emergency Medical Assistants Licensing Board is required to practise. Depending upon organizational needs and financial priorities, one can be trained for Advanced Life Support (EMA III).

Occupational first aid attendants need to be at least 19 years old and hold a Level 2 or 3 Occupational First Aid Certificate with the Workers' Compensation Board (WCB) of B.C. A medical certificate of fitness is required by the WCB before a Level 2 or 3 certificate can be issued and with each subsequent renewal of certification (renewal of these certificates is required every two years). Level 2 certification normally requires completion of a 36-hour Occupational First Aid Level 2 training course and an examination. Level 3 certification requires completion of a 70-hour Occupational First Aid Level 3 training course and an examination.

Workplaces within a 20-minute drive from a hospital usually require that First Aid Attendants hold a Level 2 First Aid Certificate. Workplaces, such as logging sites, that are in isolated areas require First Aid Attendants with Level 3 certification.

Training programs for Level 2 and 3 certification are provided by private training agencies, such as the St. John Ambulance, and must meet specific standards set by WCB. Upon completion of the training programs, students write examinations administered by WCB. All certificates are issued by WCB.

Work in this field requires an ability to deal with crises and work under pressure. Good communication skills are required, especially when informing others of the extent of the problem and the actions taken. An ability to work as a member of a team is essential. Physical stamina is also needed to meet the demands of this work.

©Stone/Vancouver

Working Conditions

Emergency medical assistants (EMAs) work both indoors and outdoors, in all kinds of weather conditions. The work is very physically demanding, as they spend much time standing, kneeling, bending and lifting. They must take precautionary measures to avoid hearing loss and back injuries. They may be exposed to contagious or potentially dangerous diseases. While work can be both physically and mentally strenuous as well as emotionally stressful, many find it challenging and rewarding.

Emergency medical assistants work shifts depending on need, scheduling factors and availability. Since services are provided around the clock, these people work weekends and holidays. Extra hours may be required.

First aid attendants working at high-risk workplaces or driving industrial ambulances may also work weekends and holidays.

Workers in this occupational group on average earned $33,900 in 1995 in B.C. Those who worked full time, full year had average earnings of $45,000. The respective all-occupation averages in the province in 1995 were $27,900 and $39,400.

There is much variation among the earnings of EMAs and first aid attendants. Full-time emergency medical assistants earn an annual average of $54,000 in wages and benefits. According to a recent graduate survey, full-time entry-level ambulance attendants earn an average of $16 per hour and work an average 38 hours per week. Part-time emergency medical assistants may start at $15 an hour and their earnings increase with experience and training. By contrast, first aid attendants can earn between $7 and $25 per hour, depending on skill levels, experience and the type of business they work for.

This is a medium-sized occupational group. Employment in B.C. was estimated at 3,480 in 1998, up approximately one-quarter from 1990. In 1996 there were 3,140 emergency medical assistants (2,520 of level 1 and above and 620 first aids) with the B.C. Ambulance Service. According to the Workers' Compensation Board (WCB) there were more than 8,000 Occupational First Aid certificate holders in B.C. in 1996. (Note, however, that not all of these certificate holders practise first aid as their primary work.)

Self-employment is rare in this occupational group (3%). Part-time employment (20%) is slightly lower than the provincial average. The respective all-occupation averages are 15% and 26%.

The unemployment in this group is slightly higher than the average for all occupations in B.C. Employment of workers in this occupational group is not much affected by business ups and downs, although there are seasonal fluctuations. These fluctuations result from the seasonal nature of some outdoor operations that require full-time first aid attendants.

Emergency medical assistants are employed by the B.C. Ambulance Service, which is considered to be part of the health services industry. First aid attendants are found in construction, logging and forestry, wood manufacturing, fish products manufacturing and many other industries. Workers in this occupational group are located all over the province. The Lower Mainland has a lower than proportional share of workers in this occupational group (47%), given its 57% share of the provincial workforce, while other regions have higher than proportional shares. This is especially true for Northern B.C. (18%), which probably reflects the greater share of isolated worksites that are required by WCB to have first aid attendants.

This occupation is dominated by men (71%). However, the share of women has been increasing during the last decade. The average age of these workers is 36, and the majority of workers (69%) are between the ages of 25 and 44. There are very few workers over the age of 55. This in part reflects the physical demands and often stressful nature of the work.

Employment Prospects

Employment growth for *ambulance attendants* and *other paramedic occupations* is projected to be at an average rate of 0.6% per year, slower than the average for all occupations in B.C. through to 2008, according to the Canadian Occupational Projections System (COPS). The total number of job openings between 1998 and 2008 is estimated at 1,380, or an average of 140 openings per year. Almost 85% of the total will be openings to replace those who retire or leave the occupation, while the rest are projected to be due to population and economic growth.

Industry sources indicate that the publicly funded ambulance service employs approximately 1,000 full-time *paramedic* and *dispatch personnel*, and approximately 2,200 part-time staff. There may be additional employment opportunities arising from staff turnover that are not captured by COPS. Turnover is high, as much of the work is part time, and the work-induced stress level is usually very high. The need to replace workers injured on the job will also provide some additional employment opportunities.

The creation of new jobs for *emergency medical assistants* reflects the increase in the population in general and the aging of the population in particular. As the population grows older, there is likely to be greater demand for emergency medical services. However, new job creation may not necessarily always keep up with demand. The provincial ambulance service is publicly funded, and the funding allocated to health care is expected to have limited growth, given the fiscal constraints faced by the provincial government. The growth rate for new job creation in the ambulance service is therefore expected to be fairly modest.

First aid attendants go through different training and licensing procedures and work in different environments from those of emergency medical assistants. They work in almost every workplace in the province, as required by provincial laws. Although some of these workers may be full-time first aid attendants, the majority of them perform various duties in addition to providing first aid services when needed. Industry sources indicate that there are many qualified first aid attendants in the labour market and that getting a full-time job as a first aid attendant is difficult. It is therefore important for those interested in working as first aid attendants to have other skills applicable to an office or a job site in addition to their first aid skills.

With additional training, first aid attendants can become emergency medical assistants at different levels or can pursue a career in occupational health and safety. Emergency medical assistants who have level 3 training may be able to work as supervisors. Alternatively, by taking additional training they can pursue careers in nursing or in other health care areas.

Additional Information

For *emergency medical assistants*
B.C. Health Ambulance Service
http://www.hlth.gov.bc.ca/bcas/index.html

Paramedic Academy of the Justice Institute of B.C.
http://www.paracademy.com

For *first aid attendants*
Workers' Compensation Board http://www.worksafebc.com

Related Occupations

- firefighters (6262)
- nursing assistants (3233)
- occupational health and safety officer (in 226 other technical inspectors and regulatory officers)
- police officers (6261)

Emergency medical assistants work shifts depending on need, scheduling factors and availability. Since services are provided around the clock, these people work weekends and holidays.

Other Technical Occupations in Therapy and Assessment

NOC 3235

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	1,180	2,170	2,540

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
370	770	1,140

Annual Growth 1998-2008

1.6%

Main Industries of Employment

Personal and Household Services	55%
Physicians, and Health Practitioners and Medical Labs	22%
Other Health and Social Services	8%

Employment by Region

Lower Mainland	63%
Vancouver Island	18%
Northern B.C.	3%
Okanagan/Kootenay	17%

Self-employment

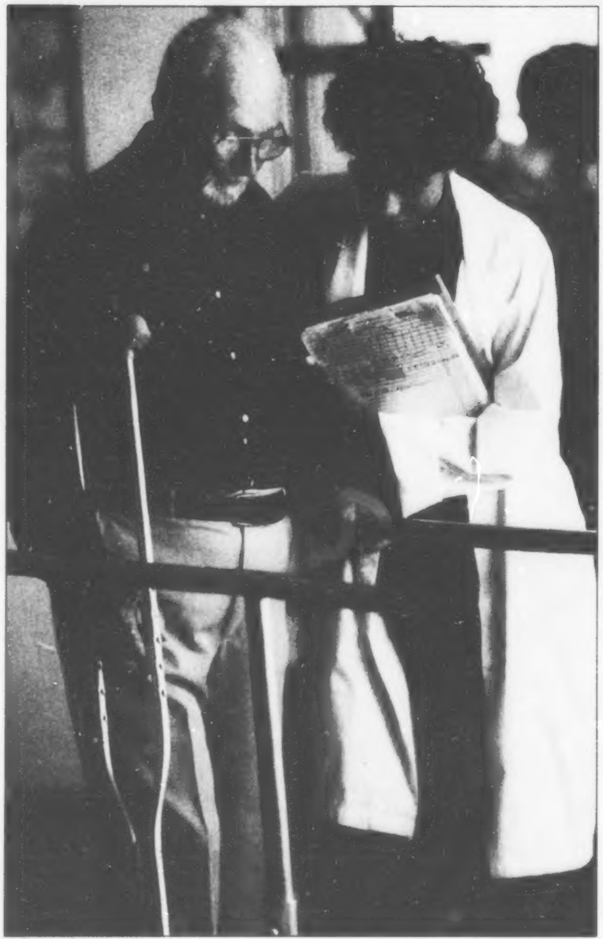
56%

Nature of the Work

This occupational group mainly includes *paramedical personnel* who provide technical support to medical care professionals, such as audiologists (hearing specialists), ophthalmologists (eye physicians or eye surgeons), physical therapists and occupational therapists. This occupational group includes *hearing aid dealers* and *consultants* who assess hearing disorders, determine the proper type of hearing aid needed and fit hearing aids on patients. Hearing aid dealers and consultants may be referred to as *audio prosthetists* in other provinces. This group also includes *massage therapists*, who assess patients and apply massage treatment to treat ailments or discomfort.

Massage therapists are the biggest group within this classification. The work of massage therapists is similar to that of a chiropractor and a physical therapist. The differences arise from the fact that while a chiropractor concentrates on manipulating bones and a physical therapist uses technology and exercises for treatment, a massage therapist focuses on manipulating muscles and soft tissues.

Generally, *ophthalmic assistants* and *rehabilitation assistants* provide technical support where health care professionals work, either in a private practice or in hospitals. In B.C. *audiometric technicians* in support of audiologists are only employed by public health units. *Industrial audiometric technicians* are either employees of big companies providing occupational health and safety services or in solo practice. Almost all massage therapists are self-employed, working either in clinics, with other massage therapists or health professionals, or in a solo practice.



©Stone/Vancouver

Main Duties

Technical-support paramedics generally perform tests or rehabilitation therapy under the supervision of health care professionals.

Audiometric technicians who are employees of public health units assist in the audiological evaluation of clients. They take clients' ear impressions, check the impressions for accuracy and process them for shipment. They service hearing aids and other equipment by completing modifications or repairs if necessary. In hearing aid clinics, they perform selective pure-tone threshold, speech audiometry and impedance tests under the direction of an audiologist. They also participate in implementing the School Hearing Conservation Program by monitoring, maintaining and explaining the use of audiometres, sound level metres and auditory training equipment. (This is hearing assisting equipment designed to enhance the hearing and understanding ability of the hearing disabled.)

There are also *industrial audiometric technicians* who carry out basic pure-tone hearing tests in the workplace. These basic pure-tone hearing tests are required by the Workers' Compensation Board (WCB) of B.C. regulation for certain workplaces where employees are exposed to noise. After the tests, these audiometric technicians discuss the results and ways to protect hearing with workers.

Ophthalmic assistants operate ophthalmic testing and measuring instruments to assess vision and vision fields and to test for diseases. For example, they use a tonometre for the detection of glaucoma. They also photograph the eye to check for pathological damage near or within the eye. Ophthalmic assistants may also assist ophthalmologists in office surgery and administer medication as prescribed by ophthalmologists.

Rehabilitation assistants carry out treatment programs, such as massage, thermotherapy, traction and hydrotherapy.

In addition to the above duties, these technical-support assistants also keep records of treatment and progress and conduct other office administrative duties.

Hearing aid dealers and *consultants* conduct tests in pure tone audiometry (measurement of the acuity of hearing for the various frequencies of sound waves), including air conduction testing and bone conduction testing. They also conduct tests by live voice or recorded voice speech audiometry, including speech reception threshold testing and speech discrimination testing. Then they evaluate audiograms and speech audiometry to determine the proper selection and adaptation of a hearing aid. They also take ear impressions and fit hearing aids on patients. In addition, they advise the hearing impaired on available medical and rehabilitation facilities.

Massage therapists usually have patients referred to them by doctors. They conduct client assessments to determine the treatment required. Then they apply appropriate massage techniques, which may include using heat, light, water or vibrating devices as well as their hands. Massage therapists may also consult with other health care professionals, such as physical therapists, chiropractors, doctors and psychologists, to develop treatment plans for clients.

Since most massage therapists are in private practice, they also have the responsibilities of running their business, which include looking after finances and the development of a client base.

Example Titles

- audio prosthetist
- audiometric technician
- hearing aid dealer and consultant
- industrial audiometric technician
- massage therapist
- ophthalmic assistant
- rehabilitation assistant

Education and Training

Audio prosthetists or *hearing aid practitioners* require completion of a two-year college program and a licence from the Hearing Aid Board of B.C. in order to practise. Currently there are no college programs for hearing aid practitioners in B.C., so people interested in this line of work usually take a two-year distance education program offered by Grant MacEwan Community College in Edmonton, Alberta. Admission to the program requires grade 12 or equivalent, and applicants must have acceptable English skills or undertake remedial work in order to obtain an acceptable level of skill. A personal interview is also conducted (by telephone for students at a distance). For some courses in the program, challenge examinations are available for those who have work experience in the area. Individuals wishing to obtain a bachelor's degree can transfer the diploma course credits to Athabasca University (distance education) in the Bachelor of Science program, majoring in Health Sciences.

Skills required include good interpersonal and communication skills, good hand-eye coordination, an ability to do precision work and an ability to work easily with persons of different ages. An interest in biology is generally required.

Audiometric technicians who work in public health clinics require grade 12, plus related experience in the health field, preferably working with people who are hearing-impaired. They are trained on-the-job by audiologists and experienced audiometric technicians. The training takes six months to a year, and specialization may require an additional six months of training.

Industrial audiometric technicians are sponsored by their employers and trained by the Workers' Compensation Board to carry out basic hearing tests. They are required to attend refresher courses annually.

Audiometric technicians need good reading comprehension and communication skills, an ability to carry out instructions and work as a team member, good time management skills, an ability to exercise sound judgement and responsibility, and an attitude of respect and sensitivity towards a diverse group of clients.

Ophthalmic assistants require a minimum of one year of supervised practical training under the supervision of an ophthalmologist and completion of an approved ophthalmic assistant home-study program. Prospective ophthalmic assistants must be employed with an ophthalmologist before and during the home study program offered through Health Sciences, Southern Alberta Institute of Technology (SAIT) in Calgary. After the required on-the-job training and the study course, students write an exam.

Ophthalmic technologists do much the same work as *orthoptists*. There is a hospital-based program for orthoptists in Vancouver. See the category Other Professional Occupations in Health Diagnosing and Testing (3123) for details on orthoptists to obtain an understanding of the activities and duties conducted by opthalmic technologists.

Work as an ophthalmic assistant demands good hand-eye coordination, close attention to detail and an ability to work precisely and accurately. Prospective assistants should enjoy working with people and be easy to approach, reassuring and sensitive.

Massage therapists require completion of a program in massage therapy from an accredited and approved school, as well as supervised practical training. In B.C. massage therapy training is available through a full-time, three-year program (with no university) or a two-year program (with one year of university) at the West Coast College of Massage Therapy in Vancouver or Victoria. Admission requirements include high school graduation with biology 12 and chemistry 12. Qualified applicants are accepted on a first-come-first-served basis. The Okanagan Valley College of Massage Therapy in Vernon offers a three-year diploma program, which requires applicants to have grade 12 graduation, with chemistry and English 12, and first year biology obtained at either university or college. All applicants are also required to have a minimum level of experience in introductory massage, which can be obtained through a weekend workshop offered by the Okanagan Valley College of Massage Therapy. Graduates of both programs must pass a provincial licensing examination and register with the College of Massage Therapists of B.C. in order to practise as a Registered Massage Therapist.

Massage therapists need to be interested in the health and well-being of others. An interest in anatomy and physiology is important. They must be tolerant and sensitive to the needs of others. Good coordination and manual dexterity are essential, and physical stamina may be needed as well.

Rehabilitation assistants require completion of a college program in rehabilitation or on-the-job training under the supervision of an occupational, recreational or physical therapist. Okanagan University College offers a 10-month Rehabilitation Assistant Certificate, which prepares graduates to work under the supervision of a therapist, implementing prepared activities. Grade 12 or equivalent, volunteer or paid work experience (at least 30 hours) with physically or mentally challenged individuals, first aid and life support training (Level C), a personal health and medical record check, a criminal record check and evidence of a negative tuberculin test are required for admission. Evidence of current immunization is recommended.

Rehabilitation assistants need to be caring, physically fit and healthy and able to follow instructions and provide simple reports of progress. Good interpersonal skills are important, as is an ability to inspire confidence and motivate clients. Assistants need to be able to talk with a variety of people and should have an interest in the health and well-being of others. They need organizational skills and must be able to participate actively as a member of a team.

All workers in this group must have patience, tact, resourcefulness, emotional stability and an aptitude for science and mathematics. Good communication and analytical skills, along with knowledge of new technology in relation to the field, are also very important.

Working Conditions

Depending on the occupation, working conditions vary for individuals in this group. *Paramedical personnel* who provide technical support work in clean and bright clinics, offices of health care professionals or in hospitals, whereas industrial *audiometric technicians* work at noisy worksites. For *audiometric assistants*, *ophthalmic assistants*, and *hearing aid dealers* and *consultants*, the work is relatively light and comfortable. However, the work for *massage therapists* and *physical rehabilitation technicians* can be physically demanding. This is because they are on their feet all day long, and massaging requires a lot of arm and hand strength.

Working hours depend on the business hours of the health care practices. Some workers in this group work a 40 hour week but may need to work evenings and weekends to accommodate the needs of patients. Some work only part time. Emergencies do arise, although less often than in other health care fields.

The 1995 average annual earnings for this occupational group were $22,600. For those who worked full time and full year, the average earnings were $31,800, compared to the B.C. averages, which were $27,900 and $39,400 respectively.

Earnings for this occupational group are diverse. Massage therapists generally earn substantially more than other paramedical personnel providing technical support. Under the current legislation, massage therapists can bill either the Medical Service Plan (MSP) or clients directly for services. Those who bill clients directly usually charge between $45 and $55 an hour for service. In either case the take home pay would be lower, as massage therapists still have to pay for their office or clinic overhead and other expenses.

Overall this is a medium-sized occupational group. Employment was estimated to be 2,170 in 1998, almost double the figure of 1,180 in 1990. Massage therapists are the largest group and are estimated to account for more than 60% of the total. This helps to explain why more than half of the workers in this group are self-employed (56%), much higher than the 15% all-occupation average. Part-time work is also quite common at 39%, which is significantly higher the all-occupation average of 26%.

As with other health care professionals where self-employment predominates, the unemployment rate is lower than the provincial average. The low unemployment rate for this occupational group as a whole can be explained by the specific training required for entry to the job. The work is not seasonal and is not affected much by general economic ups and downs.

Workers in this occupational group work in the personal and household services industry (55%). They are also found in physicians' offices and the offices of other health care practitioners. In addition, they may work in their own practices.

Workers in this occupational group are located all over the province. However, they are predominant in the Lower Mainland (63%). They can also be found in representative numbers on Vancouver Island (18%) and in the Okanagan-Kootenay area (17%) but are slightly underrepresented in Northern B.C (3%).

Women make up the majority of this occupational group (73%). Despite being the dominant group in this occupation, women on average earn substantially less than their counterparts who are men ($20,200 and $29,100 respectively). The majority of workers in this occupational group are under the age of 45, and the average age is 37, which is about the same as the provincial all-occupation average. Many young people are entering these careers.

Employment Prospects

Employment for workers in this occupational group is projected to grow at an average rate of 1.6% per year, about as fast as the average for all occupations in B.C. through to 2008, according to the Canadian Occupational Projections System (COPS). This is a medium-sized occupational group, and the total number of job openings between 1998 and 2008 is estimated at 1,140, or an average of 110 openings per year. Close to one-third of the total number of openings are expected to be the result of population and economic growth. A much larger proportion, more than two-thirds of the total, will be the result of retirements.

Massage therapists account for approximately 60% of all the workers in this occupational group, and approximately 60% of the total job openings are expected to be in that occupation according to COPS.

Industry sources indicate that this occupational group has experienced substantial growth in the recent past, due to the public's growing interest in and awareness of using alternative ways of healing. The partial funding of massage therapy through the Medical Services Plan (MSP) has also made it accessible to those who want or need the service. However, the allocation of public funds for massage therapy treatment is projected to be limited in the near future, as the provincial government continues to face fiscal constraints. Although the demand for massage therapy services is likely to remain steady, it is expected that more massage therapists will opt out of the MSP. In other words, there will be more massage therapists billing clients directly for their services.

Industry sources indicate that there is a sufficient supply of massage therapists and that competition for business is intense, particularly in populated urban centres. Those who are new to this occupation or new to the province may find more employment opportunities outside urban centres.

This occupational group also includes a number of specialties in addition to massage therapy, all of which may follow slightly different growth patterns. In general, as the population grows older and as technological developments and advancements continue, workers in these technical occupations should have a fair employment outlook.

Population growth is one of the main factors in favour of a steady employment demand for these medical technical-support personnel. With an increasingly older population, there is likely to be a continuing demand for such services as hearing aid and vision care.

Technological innovations allow more conditions and diseases to be detected and injuries treated. With the assistance of computers, many test procedures have been automated and simplified, which means that professionals specialized in diagnosis and treatment can rely on medical support staff to perform routine tasks under supervision while they concentrate on more complicated procedures. This trend will probably continue in the near future.

Even though demand for these medical technical-support services will be steady, the absolute number of openings for each of the individual occupations will remain limited, as the size of the sub-groups is fairly small. Individuals interested in specific careers should consult local employers before making training decisions.

Additional Information

For *audio prosthetists*
Grant MacEwan College Hearing Aid Practitioner Program
http://www.gmcc.ab.ca

Athabasca University http://www.athabascau.ca

For *audiometric technicians*
Workers' Compensation Board of B.C.
http://www.worksafebc.com

For *ophthalmic medical assistants*
Southern Alberta Institute of Technology (SAIT)
http://www.sait.ab.ca

For *massage therapists*
College of Massage Therapists of B.C.
http://www.cmtbc.bc.ca

Related Occupations

- audiologists (in 314 therapy and assessment professionals)
- orthoptist (in 3123 other professional occupations in health diagnosing and treating)
- physical therapists and occupational therapists (in 314 therapy and assessment professionals)

Even though demand for these medical technical-support services will be steady, the absolute number of openings for each of the individual occupations will remain limited, as the size of the sub-groups is fairly small. Individuals interested in specific careers should consult local employers before making training decisions.

Dental Assistants

NOC 3411

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	3,960	4,830	5,310

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
480	1,270	1,750

Annual Growth 1998-2008 1.0%

Main Industries of Employment

Physicians, and Health Practitioners and Medical Labs	96%
Hospitals	1%
Other Health and Social Services	1%

Employment by Region

Lower Mainland	58%
Vancouver Island	20%
Northern B.C.	7%
Okanagan/Kootenay	15%

Self-employment 1%

Nature of the Work

Dental assistants' duties include assisting dentists during the examination and treatment of patients and performing clerical functions. They also have an important role in educating the public about dental health. Most dental assistants work with dentists in private practice (Dentists are profiled in NOC 3113). Others may be employed in public health or in education.

Main Duties

Dental assistants prepare treatment rooms and patients for treatment and assist dentists during treatment. This includes preparing and manipulating dental materials, performing infection control procedures and applying rubber dams. They also instruct patients on oral care.

Those dental assistants who have completed successfully a recognized program may perform additional duties under a dentist's direct supervision. They may expose, process and mount dental radiographs. They may polish teeth and apply topical fluoride and topical anesthetic. They may also take impressions of the teeth, apply fissure sealants and perform some orthodontic procedures.

Dental assistants may also have office clerical duties. These include maintaining patient records, scheduling patients' appointments, collecting patient and insurance accounts, and ordering dental office supplies.

Example Titles

- certified dental assistant, level II
- dental assistant, level I

Education and Training

In order to work in this field, post secondary education in dental assistance is required after high school graduation. An individual with Level I training may work as a *chairside dental assistant* without certification. However, to work as a *certified dental assistant*, individuals must complete CDA Level II training and obtain a licence from the College of Dental Surgeons of B.C.

There are several Dental Assistant programs ranging in duration from 10 months to one year offered at B.C. colleges and university colleges, including Camosun College, College of New Caledonia, College of the Rockies, Douglas College, Malaspina University College, Okanagan University College, University College of the Fraser Valley and Vancouver Community College. Admission requirements include grade 12 graduation with some science courses, proof of current immunization and a criminal record check. Most colleges also require that applicants have recent certification in CPR and first aid. Consult the destination colleges calender for further information. Graduates of an accredited dental assisting program (Level II) are eligible for registration and licensing with the College of Dental Surgeons of B.C.

People interested in becoming dental assistants should have an aptitude for science, enjoy working with others and be able to deal with people who may be under stress. Personal neatness, cleanliness and good health are also important qualities. Dental assistants must have manual dexterity, good interpersonal communication skills, basic analytical skills and knowledge of new technology in relation to the field.

Working Conditions

Dental assistants work in clean and well-lit dentists' offices, hospitals, public health centres and education institutions. The work is not necessarily physically demanding, but requires good communication skills as dental assistants constantly deal with the public.

Dental assistants usually work a 40-hour week in busy dentists' offices. Some work only part time or engage in job sharing. Hours can include evenings and Saturdays, as more dentists have their businesses open at these times in order to meet patients' needs.

These workers may handle patients with contagious diseases. As a result, dental assistants must take protective measures, such as wearing masks and gloves.

The average earnings for dental assistants in B.C. were $22,200 in 1995. Full-time, full-year dental assistants earned an annual average of $27,300. The respective all-occupation averages in the province in 1995 were $27,900 and $39,400.

There are differences in the salaries earned by certified and uncertified dental assistants. According to industry sources, for a certified dental assistant the entry-level hourly wage ranges between $11 and $15 and goes up to between $14 and $21 for the experienced worker. Uncertified dental assistants earn from $8 per hour for entry-level work to $17 per hour for the experienced worker. A recent graduate survey found that entry-level dental assistants earned an average of $1,980 per month for full-time work. College graduates who find full-time, full-year employment in this occupation could anticipate earning about $24,000 a year as a starting salary.

Dental assistants make up a medium-sized occupational group. Employment of dental assistants was estimated at 4,830 in 1998, up from 3,960 in 1990. Industry sources indicate that a majority (85%) are certified dental assistants. As they work with dentists, dental assistants are generally not self-employed. A greater proportion of dental assistants work part time (31%) than the provincial average for all occupations (26%).

The unemployment rate for dental assistants is lower than the provincial average. This reflects steady demand for dental services and, as a result, steady employment demand for dental assistants. The work is minimally affected by economic ups and downs, and seasonal fluctuations in employment are rare.

Dental assistants are mainly employed in dentists' practices and medical labs (96%). The geographical distribution of dental assistants is similar to that of the entire B.C. workforce, with the largest proportion of them in the Lower Mainland (58%) and on Vancouver Island (20%).

This occupation is dominated by women (99%). There are many young people entering this occupation, and the average age of dental assistants is 34, which is lower than the provincial average of 38 for all occupations.

Employment Prospects

According to the Canadian Occupational Projection System (COPS), employment for *dental assistants* is projected to grow at an annual rate of 1.0%, or more slowly than the all-occupation average. Since this is a medium-sized occupation there is still expected to be a significant number of employment openings. Approximately 1,750 total jobs will become available in B.C. between 1998 and 2008. Projections indicate that of these, 73% or 1,270 will be the result of retirements. Current demand tends to be for certified dental assistants rather than those who are uncertified.

The main factors supporting employment demand for dental assistants are the projected population growth in B.C. and the aging of the population. During the 1990s this occupation grew rapidly in the Lower Mainland due to the increased growth of the B.C. population. However, demand for these workers in the future may be limited because B.C.'s population over the next 10 years is expected to grow only about half as fast as it did during the 1990s.

People are more aware of the importance of oral hygiene and its contribution to the overall maintenance of health than they were in the past. As a result of continued general increases in family incomes, preventive dental care has become increasingly affordable. The baby boom generation has benefited from good preventive dental care, such as regular brushing, flossing and the use of fluoride toothpaste. These preventive care practices will reduce corrective care requirements as people age, compared to the needs of past generations. The emphasis has shifted from corrective care, which requires the skills of a dentist, to preventive care, which can often be met with the skills of a dental hygienist (in NOC 3222 Dental Hygienists and Dental Therapists).

As preventive care becomes more prevalent, there may be a decreased demand for dentists. Fewer corrective services per patient visit will generally constrain the demand for dentists' services and, in turn, the services of dental assistants. The demand for dentists, and therefore for dental assistants, may also be constrained because dental hygienists, instead of dentists, can provide residents of long term residential care facilities with oral hygiene care.

Older dentists are less likely to employ dental assistants than recent graduates, who are more likely to use one, or even two assistants. As older dentists leave the occupation there will be a growth in new jobs for dental assistants. In addition, as younger dentists' workloads increase, they are expected to hire more assistants to do routine tasks, so that they can devote their time to more detailed and profitable procedures.

Industry sources believe that there will also be a need for these workers due to ongoing turnover as older assistants leave the profession or move on to other dentistry-related professions. The high amount of part-time employment in this occupation relates in part to the fact that this occupation is filled almost solely by women, some of whom take time off for child bearing and then return in a job-sharing capacity.

There is some shortage of dentists in more rural communities, especially in Northern B.C., and the same situation applies with dental assistants. The industry perspective is that graduates of dental assistant diploma programs generally do not have difficulty in finding employment, as long as they are willing to relocate. Those who are willing to relocate to a large city centre or a small community usually have the best success in finding work with a practising dentist.

Due to rapid changes in diagnostic and treatment technology, dental assistants must continually upgrade their job skills. Those who stay up-to-date with new technologies will have an advantage over others seeking employment in this field.

There are many possible career progressions for dental assistants. For many of these workers, this entry-level position serves as a stepping-stone to more highly skilled and higher paying jobs. It is possible for dental assistants working in the front office to become office managers (in NOC 1221 Administrative Officers). By taking extra training, dental assistants may progress to become dental hygienists (in NOC 3222 Dental Hygienists and Dental Therapists) or dental assistant educators. Some may choose to be surgical assistants and work in hospitals, and others may specialize in specific areas of dentistry, such as orthodontics or oral surgery.

Some dental assistants may seek alternative employment opportunities related to the dentistry field. For example, some pursue work as sales representatives for manufacturers of dental products. Still others may work for insurance companies as dental claim examiners.

Additional Information

College of Dental Surgeons of B.C. http://www.cdsbc.org

Central Island Certified Dental Assistants Society http://www.dentalassist.bc.ca

Related Occupations

- dental technician (in 3220 dental technicians and laboratory bench workers)
- dental therapists and dental hygienists (3222)
- dentists (3113)
- denturists (3221)

Nurse Aides and Orderlies

NOC 3413

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	10,230	13,960	16,740

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
2,780	3,860	6,640

Annual Growth 1998-2008	1.8%

Main Industries of Employment

Other Health and Social Services	59%
Hospitals	38%
Physicians, and Health Practitioners and Medical Labs	1%

Employment by Region

Lower Mainland	56%
Vancouver Island	22%
Northern B.C.	5%
Okanagan/Kootenay	17%

Self-employment	1%

Nature of the Work

Under the direction of nurses, hospital staff and physicians, *nurse aides* and *orderlies* assist in the basic care of patients. They are employed in hospitals, nursing homes and other health care institutions.

Orderlies in B.C. who belong to unions have the same training requirements and duties as licensed practical nurses. Readers should refer to the profile for licensed practical nurses (in NOC 3233 Nursing Assistants) for more information.

Main Duties

Nurse aides and *orderlies* provide and maintain a safe and clean environment in health care facilities. They provide basic patient care, which includes answering call signals and supplying and emptying bed pans. They provide patients with assistance in activities of daily living, such as bathing, dressing and grooming. Sometimes they serve meal trays and feed patients. To help patients recover, they lift, turn or massage patients, and they may also supervise patients' exercise routines.

As directed by nursing and hospital staff, they take basic measurements, such as patients' blood pressure, temperature and pulse. They collect specimens, such as urine, feces or sputum, administer suppositories, colonic irrigations and enemas, and perform other procedures.

They transport patients in wheelchairs or stretchers for treatment or surgery, carry messages, reports, requisitions and specimens from one department to another, and maintain an inventory of supplies.

In acute care as well as in long term care settings, orderlies perform nursing procedures, such as catheterization and sterile dressings, under the direction of a nurse.

Example Titles

- health care aide
- hospital porter
- long term care aide
- nurse aide
- nursing attendant
- orderly
- patient care aide
- personal care attendant
- psychiatric aide
- ward aide

Education and Training

Completion of some secondary school and a relevant college program are usually required for those employed in this group. In B.C. *nurse aides* are generally required to have completed a Resident Care Attendant program. Graduates are qualified to work with residents in continuing care settings, including extended and intermediate care facilities. Currently nurse aids do not require registration in British Columbia to practise.

Resident Care Attendant programs are offered by most colleges and university colleges in B.C. (See the Guide to Post Secondary Education at the end of this publication for more details.) Most institutions combine Resident Care with Home Support in one program. Resident Care programs range from three to nine months in duration, depending on whether the Home Support program is included and whether studies are undertaken on a full-time basis. All programs require reading and writing skills at a grade 10 level, and most require a standard first aid certificate, a criminal record check and evidence of good health and current immunization.

Orderlies are required to have the same training as Licensed Practical Nurses (LPN) or the equivalent. See the profile for Nursing Assistants (NOC 3233) for details about the educational program for licensed practical nurses. There are currently no public post secondary education programs or any professional regulatory organizations specifically for orderlies. Orderlies in B.C. are usually trained licensed practical nurses or have been trained as orderlies in some other province or country.

Nurse aides require physical stamina, and workers need to be patient, caring, understanding, emotionally stable and dependable. Workers must be well organized and able to provide intimate care. They should be able to work as a member of a team and be willing to perform repetitive, routine tasks.

Working Conditions

Nurse aides and *orderlies* work in well-lit and clean hospital wards or residential long term care facilities. They usually work 8-to-12 hour shifts and put in 36 to 40 hours a week. They may work weekends and holidays, and on-call and part-time work is common. The work involves constant standing or walking. The work also involves potential hazards, such as exposure to infectious diseases or toxic chemicals, and back injuries. Nurse aides and orderlies also have to cope with the emotional stress of working with the sick and disabled, as well as these patients' families.

The estimated average annual earnings for all nurse aides and orderlies in B.C. were $23,100 in 1995. The proportion of nurse aides and orderlies who work full time, full year is slightly lower than the provincial average. These workers' earnings averaged $29,400, which is lower than the provincial average of $39,400 for all occupations.

Earnings generally increase with higher skills, number of years worked, union membership and other factors. More than 60% of nurse aides and orderlies belong to unions. In unionized environments, full-time entry-level nurse aides may earn $2,570 a month ($30,800 a year), while experienced nurse aides can earn $2,630 a month ($31,600 a year) and more. Nurse aides and orderlies in non-unionized environments may earn much less. A recent graduate survey found that entry-level wages for college graduates new to this occupation were on average $1,880 per month for full-time work.

This is a very large occupational group. There were 13,960 nurse aides and orderlies employed in 1998, up by more than one-third from 1990. Self-employment is rare in this occupational group (1%). By comparison, the rate of self-employment across all occupations in B.C. is 15%. At 33%, there are more nurse aides and orderlies working part time, compared to the 26% of the total workforce in B.C. who work part time.

The unemployment rate is lower than the average for all occupations, reflecting relatively stable employment demand. Employment is mildly sensitive to business conditions, but not seasonal fluctuations. However, it does fluctuate with the overall level of other nursing personnel.

Nursing aides and orderlies are mainly employed by health and social services (59%) and hospitals (38%). They are relatively evenly distributed according to population distribution, with a slightly higher concentration in Victoria (13%) and a slight underrepresentation in Northern B.C (5%).

Most nurse aides and orderlies are women (88%). However, there is a higher percentage of men than in other nursing occupations. Despite the fact that most workers in this occupation are women, full-time, full-year earnings are higher for men, who also tend to be younger than their counterparts who are women.

The average age for workers in this occupational group is 41, just above the average for all occupational groups in B.C. This generally corresponds with the average age in other care-giving occupations.

Employment Prospects

Health care in B.C. and Canada as a whole has gone through considerable change over the last few years, and more change is expected. Population growth, an aging population and technological advancement in diagnosis and treatment are increasing the demand for health services. We are currently facing worker shortages in many health occupations and have waiting lists for many health services. This pressure is expected to continue in the future and is leading governments to explore alternative options to finance and deliver high quality health care. New approaches to medical service delivery are being considered in conjunction with other policy changes. For example, it is expected that increasing use will be made of the Internet to provide information directly to health consumers as well as to support the delivery of services by health providers.

The information in the summary table and following paragraphs, unless otherwise stated, is based on projections from the Canadian Occupational Projection System (COPS) demand model. The COPS model draws largely on historic patterns, especially on the relationship between population and the demand for health care services. As a result, it may not capture all the impacts of changing technology, delivery models and policy on health care services in B.C.

Employment for *nurse aides* and *orderlies* in B.C. is projected to grow about as fast as the average, at an annual rate of 1.8%. Approximately 6,640 total jobs will become available between 1998 and 2008 in B.C. Projections indicate that of these jobs, 58% or 3,860 will come from the replacement of those who retire. This occupational group tends to be slightly older than the all-occupation average age.

In recent years, there has been a growing trend toward privatization of health care. Industry sources indicate that health professionals across the country are deeply concerned about privatization and its impact on the accessibility and standards of health care. At time of writing, the subject of the privatization of health care was under discussion. Privatization of health care may decrease the demand for nursing aides.

This is a very large occupational group with nearly 14,000 workers in 1998. The large size offers excellent opportunity for vacancies as employees move in and out of positions. Industry sources indicate that while turnover in this occupation was high in the past, it is now lower. Although stress and lower than average wages play a part in the turnover of this group, the unemployment rate for nurse aides and orderlies tends to be lower than the all-occupation average, reflecting relatively stable employment demand. However, the demand for these workers varies with the demand for all other nursing personnel.

The projected growth rate in employment for this occupational group reflects the trends in population growth and an aging population. With population growth, there will be an increasing need for health care. B.C.'s population is expected to grow at only about half the rate that occurred during the 1990s. The decline in growth will be offset by the rapidly aging population that is increasing the number of aged persons and persons with disabilities in need of long term care.

There has been a general shift in hospitals toward the employment of licensed practical nurses (in NOC 3233 Nursing Assistants) and registered nurses (in NOC 3152 Nurses) instead of nursing aides. Hospitals now emphasize acute care and mainly treat patients with more severe illnesses. This leads to a growing complexity of standard nursing care. As a result, employment for nurse aides in these institutions will continue to decline.

Although population growth and an aging population will increase the demand for medical care, public funding will probably continue to be constrained. In spite of possible federal and provincial increases in funding, ongoing fiscal constraints will continue to shift employment opportunities from hospitals to home care and privately run institutions.

Technological innovations in the science of health care have made it possible to treat more patients and to provide better health care. Hospitals are able to reduce the number of nursing staff by reducing the number of overnight patients and by shifting more patients to day surgery, as well as by placing more long term patients in residential care facilities. However, technological changes do not necessarily displace human contact and comfort, which make up a significant part of nursing responsibilities. The greatest impacts on this occupational group will therefore be changes in how and where health care is provided.

Nursing aides are employed mainly in residential care facilities, such as long term care facilities, extended care facilities, intermediate care facilities and group homes for people with mental, emotional or physical disabilities. It is in these areas that most of the employment opportunities are expected to be in the future. Many of these opportunities will be in non-unionized environments with private hospitals (for more details also refer to the profile of Visiting Homemakers, Housekeepers and Related Occupations in NOC 6471). These changes reflect the provincial policy initiative of emphasizing primary care and the delivery of health care services closer to home. In contrast, reduced numbers of beds and the closure of hospitals and hospital units means that employment demand for nurse aides in hospital settings is limited.

It is possible for nurse aides to become LPNs with further education. Those nurse aides who enhance their skills with complementary training, such as child care, mental health, or rehabilitation assistant training, generally earn better wages and have better success finding employment.

Individuals interested in this occupational group might want to consult local sources (for example, hospitals and colleges that offer training) for up-to-date information before making career and training decisions.

Additional Information

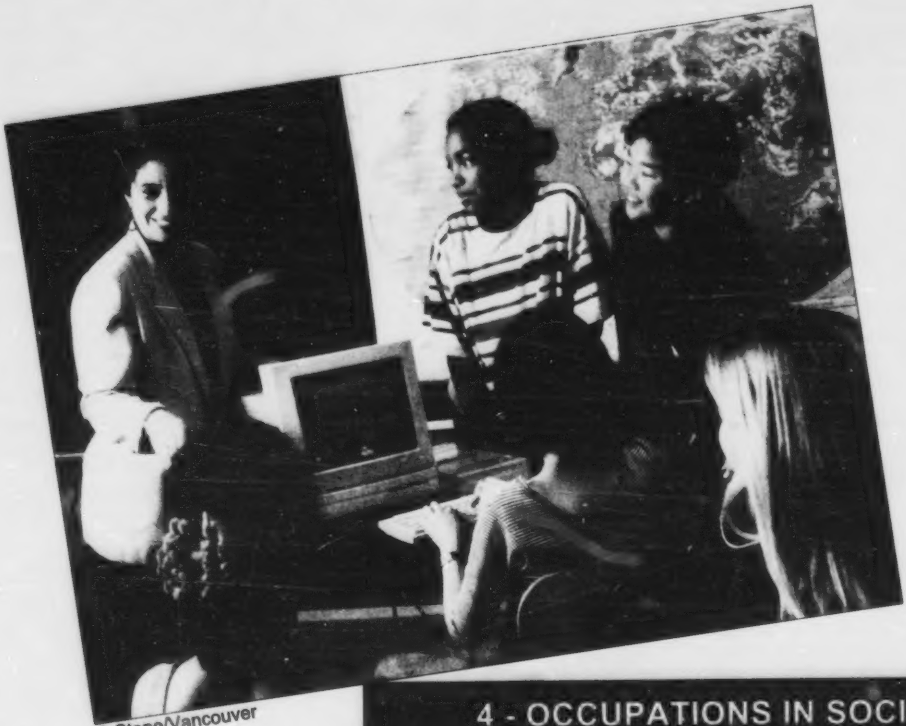
Hospital Employees' Union http://www.heu.org
Http://www.heu.org/feature.asp

Burnaby HRCC
http://www.bc.hrdc-drhc.gc.ca/burnaby/common/industryhealth.html

Related Occupations

- nursing assistants (3233)
- visiting homemakers, housekeepers and related occupations (6471)

The projected growth rate in employment for this occupational group reflects the trends in population growth and an aging population. With population growth, there will be an increasing need for health care.



© Stone/Vancouver

4 - OCCUPATIONS IN SOCIAL SCIENCE, EDUCATION, GOVERNMENT SERVICE

Skill Level A - Professional Occupations

4112 Lawyers 260
4121 University Professors 263
4131 College and Other Vocational Instructors 265
414 Secondary and Elementary School Teachers and Counsellors 267
4151 Psychologists 271
4152 Social Workers 273
4153 Family, Marriage and Other Related Counsellors 276
4155 Probation and Parole Officers and Related Occupations 278
416 Policy and Program Officers, Researchers and Consultants 280

Skill Level B - Technical, Paraprofessional and Skilled Occupations

4211 Paralegal and Related Occupations 287
4212 Community and Social Service Workers 290
4213 Employment Counsellors 292
4215 Instructors and Teachers of Disabled Persons 295

Lawyers

NOC 4112

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	6,180	8,660	10,560

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
1,900	1,010	2,910

Annual Growth 1998-2008 2.0%

Main Industries of Employment

Professional Business Services	86%
Provincial and Territorial Administration	3%
Federal Administration	3%

Employment by Region

Lower Mainland	71%
Vancouver Island	15%
Northern B.C.	4%
Okanagan/Kootenay	9%

Self-employment 54%

Nature of the Work

Lawyers advise clients on legal matters, plead cases or conduct prosecutions in courts of law. In addition, they represent clients before tribunals and administration boards and draw up legal documents, such as contracts and wills. They are employed in law firms, prosecutors' offices, federal, provincial and municipal governments and various business establishments, or they may be self-employed. Articling students are included in this occupational group.

Main Duties

Lawyers advise clients of their legal rights and all matters related to law. They plead clients' cases before courts of law, tribunals and boards. They work out legal solutions to client problems and draw up the resulting legal documents, and they draw up legal documents, such as real estate transactions, wills, divorces and contracts. They also negotiate settlements of civil disputes, perform administrative and management functions related to the practice of law and may act as executor, trustee or guardian in estate and family law matters.

Example Titles

- general counsel
- corporate counsel
- crown attorney
- law partner
- legal advisor
- attorney
- barrister
- crown prosecutor
- solicitor
- articling student

Education and Training

Admission to the British Columbia Bar requires completion of at least two years of an undergraduate degree program followed by completion of a Bachelor of Laws (LLB) degree, a nine-month articling period and successful completion of the Professional Legal Training Course (ten weeks) including examinations. Acceptable undergraduate programs are available at public universities and university colleges, and university transfer is available through most colleges. A focus on commerce and accounting courses may be advisable for those who wish to practise business law.

The University of British Columbia (UBC) and the University of Victoria (UVic) offer three-year LLB programs. UVic offers a co-op option in its LLB program. Applicants must write the Law School Admission Test (LSAT), and only those with the highest undergraduate grades and LSAT scores are accepted. Both universities have discretionary provisions for admitting mature, disabled and First Nations applicants.

UBC and UVic offer a combined LLB and Master of Business Administration. UVic also offers a combined LLB and Master of Public Administration.

The possession of an LLB does not in itself confer the right to practise law in B.C. Admission to the Bar of the Province of B.C. is governed by the Legal Profession Act and the regulations of the Law Society of B.C. An applicant for admission to the Bar must comply with requirements of the Law Society as to academic standing, professional training and ethical standards. The requirements presently include an admission program of approximately one year, during which the applicant must serve as an articled student with a practising member of the Bar and complete a training course and qualifying examination. Upon successful completion the applicant is then "called to the bar" and entitled to practise law. *Lawyers* may specialize in a particular area of law through experience and continuing professional education.

Prospective lawyers should have better than average intelligence and a good understanding of human nature. The practice of law is very demanding, therefore an ability to handle high levels of stress and long work days is important. Those choosing a career as a lawyer need to be able to think logically and analytically, should express ideas clearly, accurately and convincingly (both in written form and verbally) and must be good problem-solvers.

The practice of law requires responsibility, integrity and honesty, and lawyers must possess a strong ethical code. A criminal record may prevent one from becoming a lawyer. Business knowledge and skills, computer skills and an ability to work independently are generally required. To be successful, lawyers must upgrade their skills continually and continue their pursuit of legal knowledge. Those who are self-employed must develop good business skills in order to manage the delivery of their product.

Note that lawyers wishing to practise civil law in another province may be required to pass examinations set by the provincial law society.

©Stone/Vancouver

Working Conditions

Lawyers spend much of their time in offices and, to a lesser extent, in law libraries and courtrooms. When conferring with clients, they usually discuss their cases in the lawyer's office, but meetings sometimes take place in clients' homes or places of business. In some cases, meetings occur in hospitals or in correctional facilities. Travel is often necessary to attend meetings, conduct research, gather evidence, or appear before courts, legislative bodies and other authorities.

Lawyers in private practice often have to work irregular hours. The work week of many practitioners exceeds 50 hours, and they can be under very heavy pressure, especially when a case on which they are working is being tried. Preparation for court involves keeping informed of the latest laws and judicial decisions. Salaried lawyers working in government or for private corporations are also under pressure during court appearances, but in general, their work schedules are more structured and conventional.

In 1995 the average annual earnings for all individuals in this occupational group were $78,000. The majority worked full time for the full year, and they received an average of $84,400 in earnings. The number of those employed in this occupation rose from 6,180 in 1990 to 8,660 in 1998. A recent industry consultation indicated that starting salaries for new workers could range from $30,000 to $55,000 per year, based on full-time, full-year employment.

Over half (54%) of the lawyers in B.C. are self-employed, which is far higher than the all-occupation average (15%). Only 6% work part time. The all-occupation rate for part-time employment in B.C. is 26%. As is the case with other professionals and self-employed workers, unemployment is very low compared to the B.C. average.

The vast majority (86%) of lawyers work in professional business services. An additional 6% are employed by either the federal or the provincial government. About 71% are located in the Lower Mainland, a proportion that is substantially higher than the all-occupation average for that region. About 15% of these workers are on Vancouver Island, 9% are in the Okanagan-Kootenay, and 4% are in Northern B.C. The Law Society of B.C. recently reported that some firms outside the Lower Mainland report difficulty in recruiting articled students and young lawyers. The distribution of these workers in B.C. reflects the urban nature of the occupation, which may be partly explained by the concentration of legal administrative systems found in large cities.

Women account for 29% of the lawyers in B.C. In view of the fact that they currently make up a higher proportion of the enrollment in most law schools, it is very likely that the representation of women in the legal profession in this province will increase. In fact, 44% of the women in this occupation are in the 35 to 44 age group. However, women earned significantly less in full-time, full-year earnings in 1995 ($62,600) than men who worked full time, full year ($91,500) during the same period.

As is often the case in professional occupations, the time needed to complete the educational requirements prevents all but a few individuals from entering this field at a young age (less than 1% are under 25 years old). The proportionate representation of those aged 35 to 44 is much higher (37% of all lawyers) than the all-occupation average for that age group (28%).

Employment Prospects

The Canadian Occupational Projection System (COPS) forecasts an annual growth rate between 1998 and 2008 of 2.0% for *lawyers*, which is faster than the all-occupation average. Approximately 2,910 positions will open during this period. About two-thirds of these positions will be the result of economic growth, and one-third will be to replace people retiring. The majority of new opportunities will be in the Lower Mainland region of B.C. In 1999 for example, 68% of Law Society of British Columbia members were from Greater Vancouver.

According to industry sources, law firms outside the Lower Mainland of B.C. have difficulty obtaining articled students and young lawyers to work for them. This may be because they do not want to live and work in more remote areas. A willingness to relocate to such regions as Northern B.C. can increase the chances of prospering in this competitive field, especially for lawyers who wish to work in private practice. Establishing a new practice will be easiest in small towns and expanding suburban areas. In such areas, competition from larger established law firms is likely to be less than in larger cities, and new lawyers may find it easier to become known to potential clients. As a result of their reluctance to move to more remote areas, many lawyers in the Lower Mainland are reducing their income expectations. This suggests there is an oversupply of lawyers in this area.

The number of new graduates from law schools have been exceeding the number of new employment prospects available to lawyers for a number of years. This suggests that the COPS forecast may be too optimistic and that graduates are using their education in other occupational areas.

Grades at law school can be a strong factor in determining a graduate's chances of obtaining an articling position. Individuals with superior academic records from highly regarded law schools usually enjoy excellent articling opportunities. Other graduates have to be prepared to encounter stiff competition in the process of obtaining their first opportunity for professional experience. Competition is strong for articling student positions in the Lower Mainland.

There is also strong competition in the Lower Mainland for work after articling is completed. Lawyers in private practice have been struggling to attract enough business to maintain expected income levels and, in some cases, to keep their practices afloat. The legal aid case work for government that some private practitioners perform has been handled increasingly by government staff lawyers, whose salaries are not very high by industry standards. As well, since the fees that lawyers charge are higher than those of paralegals (NOC 4211), many potential clients use a paralegal's services instead, when possible.

Many individuals with law degrees work in areas of law that are outside their areas of interest or for which they may feel they are overqualified. Some set up their own law practices earlier in their careers than they would consider to be ideal. Other law school graduates have pursued work in fields other than law. Some work in administration, management or research positions with banks, trust companies, real estate firms, insurance companies, government agencies and other organizations in which their legal education is an asset but not a requirement. Whichever career path they decide to pursue, it is apparent that members of this occupational group must be adaptable.

Some lawyers are affected by the cyclical swings in the economy. For example, the demand declines for some discretionary legal services, such as planning estates and drafting wills, when the economy is slow. There is also a decline in real estate transactions if housing sales are slow. Corporations are less likely to litigate cases when declining sales and profits result in budgetary restrictions. However, during recessions there is sometimes more work for lawyers. For example, individuals and corporations face an increase in other legal problems during business downturns, such as bankruptcies, foreclosures and divorces requiring legal action.

For those who decide to remain in the legal profession, there are a number of practice areas that appear to hold good prospects.

The demand for specialized lawyers is increasing, while the percentage of generalists is beginning to decline. A growing trend is for small specialized or boutique firms in such areas as aboriginal rights, international law, patents, trademarks and trade secrets, and Internet law. Environmental law is a specialty that will develop further with the enforcement of environmental legislation.

Additional demand that will boost employment for lawyers can also be expected in immigration, intellectual property, entertainment, international law and the construction industry. There are also opportunities in labour law. However, there may be stagnation and possibly even decline in some sectors, such as insurance, mergers and acquisitions, real estate, financial services and social law. Involvement in multi-professional firms, which combine lawyers, accountants (in NOC 1111 Financial Auditors and Accountants), notaries (in NOC 4211 Paralegal and Related Occupations), architects (in NOC 215 Architects, Urban Planners and Land Surveyors), etc., may also become a reality for an increasing number of lawyers. Another trend is for contract lawyers, recruited through temporary placement agencies, to assist law firms with heavy short-term workloads.

Even those lawyers who spend a large amount of their time in court can earn income from mediation, arbitration, conciliation, prevention and consulting. Mediation is a new field that has opened up largely in response to legal costs and delays. Mediation services have been provided previously by mediation consultants, but increasingly lawyers are providing this service.

Writing ability and knowledge of other languages are advantageous skills for lawyers. Training in alternative methods of conflict resolution before administrative courts is also an important asset.

Additional Information

Law Society of British Columbia
http://www.lawsociety.bc.ca

Continuing Legal Education Society of British Columbia
http://www.cle.bc.ca

Related Occupations

- legal department directors (in 01/09 middle and other management)
- legal firm managers (in 01/09 middle and other management)
- notaries public and trademark agents who are not lawyers (in 4211 paralegal and related occupations)
- patent agents who are not lawyers (in 416 policy and program officers, researchers and consultants)

> ***Writing ability and knowledge of other languages are advantageous skills for lawyers. Training in alternative methods of conflict resolution before administrative courts is also an important asset.***

University Professors

NOC 4121

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	3,400	4,560	5,470

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
910	2,670	3,580

Annual Growth 1998-2008 1.8%

Main Industry of Employment

Education	100%

Employment by Region

Lower Mainland	67%
Vancouver Island	25%
Northern B.C.	2%
Okanagan/Kootenay	5%

Self-employment 0%

Nature of the Work

University professors teach courses to undergraduate and graduate students and conduct research at universities and degree-granting colleges. University professors who are heads of departments are included in this occupational group.

Main Duties

University professors teach one or more university subjects to undergraduate and graduate students. They prepare and deliver lectures, conduct laboratory sessions or discussion groups, and prepare, administer and grade examinations, laboratory assignments and reports.

They also direct the research programs of graduate students, advise on research matters, conduct research in their field of specialization and publish findings in scholarly journals or books. They may serve on faculty committees dealing with such matters as curriculum planning and degree requirements and may provide professional consultative services to government, industry and private individuals.

Example Titles

- assistant professor, botany
- associate professor, linguistics
- professor of computer sciences
- professor of medicine
- university instructor, engineering
- chairperson, food sciences department
- department head, geography
- lecturer, university
- English professor

Education and Training

Increased competition for faculty positions has made completion of a doctoral degree (PhD) virtually essential in order to work as a *university professor*, although some part-time and instructor positions are held by individuals with master's degrees. Two to five years of post-doctoral work is often necessary, and published research in peer-reviewed journals may also be a prerequisite. Licences or professional accreditation may be required for professors teaching future practitioners in certain professionally-regulated fields, such as medicine, engineering, architecture, psychology or law.

Doctoral programs usually require two to five years of study beyond the master's degree (which is usually two years of study beyond the bachelor's degree), including intensive research for a doctoral dissertation that makes an original contribution to the candidate's field of study. A working knowledge of one or more foreign languages and, in many fields, advanced mathematical, statistical and computer knowledge, are often required.

Doctoral programs in a variety of fields are available at most public universities in B.C. Study towards a bachelor's degree may begin by entry into a one- or two-year university transfer program at a university college or community college.

University professors require inquiring, analytical, critical minds and a strong desire to pursue and disseminate knowledge. They must be self-motivated, but able to work as a member of a team. They must have good communication, research, writing and teaching skills. They should be able to motivate students and enjoy interacting with a wide variety of people. They need to be adaptable, flexible and able to balance their time between a variety of tasks. Professors must be good organizers and able to handle heavy work loads. Knowledge of computer software application is commonly required, and in some disciplines the need for computer skills in word processing, information storage and retrieval and data analysis is extensive. Ongoing education in new teaching and research methods as well as in a chosen field of expertise is generally necessary.

University professors advance through a series of ranks, going from assistant professor to associate professor and, finally, to full professor status. The responsibilities of each rank are about the same, but salaries increase with rank to reflect teaching and research achievements and years of service.

Working Conditions

University professors generally have flexible hours. They must be present for classes, usually 12 hours a week, as well as for faculty and committee meetings. In addition, most establish regular office hours for student consultations, usually three to six hours a week. Conducting original research, publishing, university and community service are carried out in the remainder of the time, and most professors work more than a 40 hour week. However, they are relatively free to decide when and where they will work, and how much time to devote to course preparation, grading papers and exams, study, research and other activities. They may work staggered hours and teach classes at night and on weekends, particularly those faculty who teach older students who may have full-time employment or family responsibilities on weekdays. University faculty have even greater flexibility during the summer when they may teach or do research or pursue other academic interests. They are expected to work (teach or do research) during the summer months, and industry experts report that only part-time lecturers work part year. Most universities have funds used to support faculty research or other professional development needs, and some limited funds may be available for travel to conferences and research sites.

Part-time university teachers usually spend less time on campus as they often don't have a permanent office. In addition, they may teach at more than one institution, requiring travel between their various places of employment.

In 1995 the average annual earnings for all individuals in this occupational group were $54,300. University professors who worked full time for the full year received an average of $69,300 in earnings. Similar to other professions where a long period of training is required, entry into this career is at about 32 years of age, which may significantly lower the overall lifetime earnings. The number of employed workers in this group rose from 3,400 in 1990 to 4,560 in 1998.

Self-employment is almost non-existent among university professors. About 19% of this occupational group are employed part time (compared to 26% for the B.C. all-occupation rate) and, like most professionals, unemployment is lower than the all-occupation average.

All professors in B.C. (100%) identified themselves as being employed in education. These workers appear to concentrate in the Lower Mainland (67%) and on Vancouver Island (25%), corresponding to the concentration of post-secondary institutions, such as UBC, SFU and the University of Victoria. However, the University of Northern B.C. in Prince George has now opened, increasing slightly the representation of this occupation in Northern B.C.

Women account for 38% of this occupational group. Available data indicates that women in this group earn substantially less for full-time, full-year employment ($57,000) than men ($74,700), and average annual earnings for women are approximately 36% lower than their male counterparts.

University professors tend to be older (46) than the B.C. workforce (38). This is partly due to the number of years it takes to gain the qualifications to be a professor. The representation of those aged 45 years and older is higher than the all-occupation average of B.C. and is especially high for those aged 55 to 64.

Employment Prospects

Employment of *university professors* is projected to grow by an annual rate of 1.8%, about as fast as the average for all occupations through to the year 2008. There are 3,580 total employment openings projected in B.C. between 1998 and 2008. Three-quarters of the openings will be due to workers who retire. With a large number of professors hired during the 1960s who are now facing retirement, B.C. could face an increased demand for these workers over the next decade. It should be noted that the long-term growth projection for this occupation is dependent on the continuation of a positive public policy climate for post secondary education in B.C.

In March 2000 the provincial budget provided an increase of $85 million to universities and colleges to restore core funding, help with the tuition freeze, and create 5,025 new student spaces. These new student spaces bring the total number of seats added since 1996 to nearly 21,000, exceeding the government's goal to create an additional 20,000 spaces by 2001. These additional student spaces, combined with frozen tuition levels, are leading to greater enrollments. Despite these increases, tight budgets restrain the hiring of full-time professors. Some institutions are expected to rely more on full-time faculty on limited-term contracts, reducing the number of tenured positions available. These positions allow universities greater flexibility in planning the curriculum and adapting to fluctuations in student enrollment. Industry sources report that sessional part-time professors, increased class size and increased use of technology will continue to take up the slack. Increases in distance education may restrict student population growth at large university institutions while opening up opportunities for part-time, distance education tutors.

In future years, *university professors* will have to adjust to new distance-education technologies. These technologies will add to the complexity of their teaching and professional duties and will require them to keep up-to-date with changes in this expanding field. Educators and business leaders predict that online learning will make up 15% of the total education market in B.C. by 2001.

Universities are beginning to use online learning to expand their student base without having to acquire more facilities. Students generally complete a short on-campus residency at the beginning and the end of their courses. In the interim, students complete the majority of the course work using the Internet. Distance-education programs, if expanded substantially, could reduce the need for full-time university professors and increase the need for more adaptable part-time and contract university professors and sessional lecturers.

Currently, only 17% of professors in the province are under the age of 35, compared with the all-occupation average of 40% in this age group. Given the higher than average age of professors, the rate of replacement should accelerate over the next few years. However, tenured professors usually continue to teach until the conventional retirement age of 65, thus restricting newcomers' access to full-time positions. To provide opportunities for younger PhD graduates who were unable to obtain permanent employment during the 1990s, universities are exploring voluntary early retirement options.

Promotion to senior positions within a department or faculty is possible with experience. This is especially true in fields such as business, engineering, health science and computer science. These fields offer more non-academic job opportunities and also attract fewer applicants for academic positions.

Related Occupations

- administrators in post-secondary education and vocational training (in 01/09 middle and other management)
- college and other vocational instructors (4131)

College and Other Vocational Instructors

NOC 4131

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	9,940	13,590	17,060

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
3,470	5,020	8,490

Annual Growth 1998-2008 2.3%

Main Industries of Employment

Education	75%
Other Business Services	5%
Professional Business Services	3%

Employment by Region

Lower Mainland	64%
Vancouver Island	17%
Northern B.C.	7%
Okanagan/Kootenay	12%

Self-employment 14%

Nature of the Work

This occupational group includes *instructors* who teach applied arts, academic, technical and vocational subjects to students at community colleges, CEGEPs, agricultural colleges, technical institutes, language schools, bible colleges and other vocational schools. It also includes *trainers* who are employed by companies and governments to teach internal training and development courses.

College teachers who are heads of departments are included in this group as well.

Main Duties

College and *other vocational instructors* teach students using a systematic plan of lectures, demonstrations, discussion groups, shop sessions and seminars. They prepare teaching materials and outlines for courses as well as prepare, administer and mark exams and papers to evaluate students' progress. They often advise students on program curriculum and career decisions. They may also serve on faculty committees concerned with matters such as budgets, curriculum revision and course and diploma requirements.

Example Titles

- company trainer
- training officer
- community college teacher
- vocational school teacher
- college department chairperson, trade programs
- college teacher
- computer training instructor
- teacher, legal assistant program
- department head, dental hygienist program
- CEGEP teacher
- commercial art instructor
- hairdressing teacher
- language instructor, language school

©Stone/Vancouver

Education and Training

College instructors who teach university transfer courses need at least a master's degree in their subject area. Increased competition for these teaching positions has made completion of a doctoral degree (PhD) advantageous. A master's degree is usually two years of study beyond a bachelor's degree, and a doctoral degree requires two to five years of study beyond the master's degree.

Master and doctoral programs in a variety of disciplines are available at most public universities in B.C. Study towards the bachelor's degree may begin by entry into a one-or-two year university transfer program at a university college or community college. A minimum of a master's degree, along with extensive experience, is recommended for instructors of career and technology programs, although those with a bachelor's degree may find part-time, entry-level positions.

Some instructors of trades (vocational/technical) do not need post secondary education and are considered qualified by their expert knowledge and extensive work experience, as implied by a certificate of qualification in their trade. However, completion of programs, such as the Industrial Education (Technology Education) Teacher Education Program offered jointly by the University of British Columbia and the British Columbia Institute of Technology, or the Provincial Instructor's Diploma Program offered by Vancouver Community College, is recommended. Adult basic education instructors usually require a bachelor's degree in education.

Like university professors, college and vocational instructors should have inquiring minds and a desire to pursue and disseminate knowledge. Good communication and teaching skills as well as an ability to motivate students are necessary. Computer and electronic communication skills are becoming increasingly necessary.

Working Conditions

Most *college* and *other vocational instructors* have flexible schedules. In addition to teaching classes, college instructors who are also members of a college's faculty must be present for faculty and committee meetings. They also need to be available to students for consultation during designated office hours. Outside of these responsibilities, they have some degree of flexibility in deciding how much time and effort to devote to course preparation, grading papers and exams, study or research. Schedules during summer or school holidays may be even less regimented, allowing instructors to teach, conduct research or pursue non-academic interests. Many post secondary institutions provide some funds to support professional development for faculty, such as the provision of expenses associated with attending conferences.

Adult education instructors usually teach during evenings or sometimes on weekends in order to accommodate the work and family commitments of older students. Company trainers or training officers have to structure their instruction sessions to accommodate the schedules of various workers or work units, depending on what training arrangements have been made. They must be prepared to travel and spend some time attending to administrative functions.

Part-time college instructors generally spend less time on campus outside of their classes, as they usually do not have an on-campus office. They may teach courses at more than one institution, which would require travel between their various places of employment.

In 1995 the average annual earnings for all individuals in this occupational group were $32,200. Instructors who worked full time, full year received an average of $47,800 in earnings. This is a very large occupational group. The number of employed workers in this group rose from 9,940 in 1990 to 13,590 in 1998, an increase of over 30%.

Just over 14% of this group are self-employed, and about 33% work on a part-time basis. By comparison, the all-occupation averages for self-employment and part-time work are 15% and 26% respectively. Unemployment is just under the all-occupation average. Sessional and contractual work is common, as is part-year work.

The education industry is the largest employer in this group (75%). The remaining workers are found in a very wide range of industries, with the largest concentrations employed in other business services (5%) and the remainder in areas such as professional services, health, administration and the retail sector.

Women account for a little over half (54%) of the workers in this group. This is higher than the all-occupation average for B.C. where women account for 46% of all workers.

About 64% of this group is located in the Lower Mainland, 17% are on Vancouver Island, 12% are in the Okanagan-Kootenay, and 7% are in Northern B.C.

As would be expected for an occupation in which the educational requirements take a substantial number of years to complete, representation of workers under the age of 25 is much lower than the all-occupation average. The proportion of the group aged 25 to 34 is also lower than average, while representation of these in the 45 to 54 age group is significantly higher. Overall, 61% of these workers are between the ages of 35 and 54, compared to the overall B.C. workforce, which accounts for 49% of this age group.

Employment Prospects

The forecast for this occupational group calls for growth by an annual rate of 2.3%, faster than the all-occupation average and slightly higher than the forecast for university professors. It is estimated that 8,490 jobs will become available in British Columbia between 1998 and 2008. Approximately 59% or 5,020 of these openings will be the result of retirements. The forecast is also affected by an increasing demand for business and technical courses that arises from a workforce needing to upgrade education and skills. Since most college and vocational instructors work in the public post secondary education system, the long-term growth projection is dependent on the continuation of a positive public policy climate for post secondary education in B.C.

Some industry sources agree that most job opportunities will result from retirements and replacements rather than new job creation. The average age of college and other vocational instructors is 42 years. This is slightly higher than the all-occupation average of 38 years. It should be noted that many of these positions may be filled on a part-time or contract basis. A growing population in B.C. and the need for businesses to provide more skills upgrading, especially in some technical and applied technology fields, are other factors cited by industry observers as contributing to the demand for instructors.

In March 2000 the provincial budget provided an increase of $85 million to universities and colleges to restore core funding, help with the tuition freeze and create 5,025 new student spaces. These new student spaces bring the total number of seats added since 1996 to nearly 21,000, exceeding the government's goal to create an additional 20,000 spaces by 2001. These additional student spaces, combined with frozen tuition levels, are leading to greater enrollments. However, tight budgets are restraining the hiring of full-time instructors. Efforts at various levels of government to promote the benefits of skills upgrading are resulting in an increased demand for continuing education programs and vocational training. As well, the development of new, more flexible types of work arrangements, such as unpaid study leave, flex time, work on a time-sharing basis, self-employment and working at home, have allowed people considerable freedom in rearranging their work schedules. Consequently it has become much easier for these workers to take part in training upgrading, further contributing to the boost in demand for post secondary instructors. Some of these demands for upgrading will be met by the strong private college structure in British Columbia, or by private trainers, and will provide opportunities, often on a contract basis, for instructors.

Because training in applied science-related fields at the college level can often offer better employment prospects than many university disciplines, demand for competent instructors with up-to-date knowledge of new technologies may arise. This demand may be met by colleges recruiting instructors from other parts of the country. Recent changes in Ontario, though, may reduce the available supply of out-of-province instructors for B.C. The Ontario government recently increased funding for colleges by $750 million. In addition, Ontario has eliminated grade 13 from their secondary schools. Post secondary institutions will be required to expand to cope with twice as many students graduating in 2003. While these two factors will increase the demand for qualified instructors in Ontario, they will reduce the available supply of instructors for B.C.

In recent years, B.C. public post secondary institutions have begun to rely more on part-time instructors. These positions are also popular with institutions because they allow for greater flexibility in planning the curriculum and adapting to fluctuations in student enrollment. There has also been a major expansion in the number of private post secondary training institutions that provide technical, vocational and language training. These institutions often offer part-time and contract positions.

In the future, college instructors may need to adjust to distance-teaching technology, which will add to the complexity of their teaching and professional duties and require them to keep abreast of technological changes. Educators and business leaders predict that online learning will make up 15% of the total education market in B.C. by 2001. Colleges are beginning to use online learning to expand their student base without having to acquire more facilities. In this case, students complete the course work using the Internet and do not attend the campus facilities. Thus, distance-learning programs, if expanded substantially, could reduce the demand for full-time *college* and *other vocational instructors* and increase the need for more adaptable part-time and contract college and other vocational instructors.

Progression to administrative positions in post secondary education is possible with experience.

Related Occupations

- secondary school teachers (in 414 secondary and elementary school teachers and counsellors)
- university professors (4121)
- A minimum of a master's degree, along with extensive experience, is recommended for instructors of career and technology programs,

Secondary and Elementary School Teachers and Counsellors

NOC 414

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	37,800	48,000	51,020

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
3,020	19,740	22,760

Annual Growth 1998-2008	0.6%
Main Industry of Employment	
Education	100%
Employment by Region	
Lower Mainland	53%
Vancouver Island	19%
Northern B.C.	11%
Okanagan/Kootenay	17%
Self-employment	0%

Nature of the Work

Secondary school teachers prepare and teach academic, technical, vocational or specialized subjects at public and private secondary schools. Secondary school teachers who are heads of departments and high school librarians are included in this occupational group.

Elementary school and *kindergarten teachers* teach basic subjects, such as reading, writing and arithmetic, or specialized subjects, such as English or French as a second language, at public and private elementary schools. Elementary school librarians are also included in this group.

School and *guidance counsellors* advise students on educational issues, career planning and personal development, and coordinate the provision of counselling services to students, parents and teachers. They are employed by school boards and work in elementary and secondary schools.

Main Duties

Secondary and *elementary school teachers* prepare subject material for presentation to students according to an approved curriculum. Elementary school and kindergarten teachers teach students using a systematic plan of lessons, discussions, audio-visual presentations and field trips. Secondary school teachers use all those elements in their systematic plans of teaching as well as using lectures, laboratory studies and shop studies. Elementary school and kindergarten teachers also lead students in activities to promote their physical, mental and social development as well as their school readiness.

These teachers also assign and correct homework, prepare, administer and correct tests, evaluate progress of students and discuss results with students, parents and school officials. They participate in staff meetings, educational conferences and teacher training workshops.

Elementary school and *kindergarten teachers* may supervise teachers' aides, while *secondary school teachers* may advise students on course selection as well as on vocational and personal matters.

School and *guidance counsellors* counsel students regarding educational issues, such as course selection, school adjustment, truancy, study habits and career planning. They also counsel students regarding personal and social issues such as substance abuse, depression, sexuality, self-esteem and family problems. They consult with teachers and parents regarding various issues and concerns and with administrators and community agencies regarding programs and referrals. Counsellors coordinate the provision, to students, parents and teachers, of counselling and information services, such as career information services, professional development sessions and interaction with other educational institutions, and they administer and interpret standardized intelligence, aptitude and interest tests. They may teach regular classes.

©Stone/Vancouver

Example Titles

secondary school teacher (4141):

- adult education teacher, secondary school
- high school teacher, special education
- biology teacher, high school
- commerce teacher, secondary school
- department head, secondary school
- English teacher, secondary school
- English as second language teacher, high school
- French as second language teacher, high school
- history teacher, secondary school
- librarian, high school
- supply teacher, high school
- vocational teacher, high school

elementary school and kindergarten teachers (4142):

- kindergarten teacher
- elementary school teacher
- primary school teacher
- elementary school teacher, English as a second language
- elementary school teacher, French as a second language
- French immersion teacher, elementary school
- librarian, elementary school
- special education teacher, elementary school
- supply teacher, elementary school

school and guidance counsellors (4143):

- student counsellor
- guidance counsellor
- school counsellor
- educational counsellor

Education and Training

Certification from the B.C. College of Teachers is required to be a *kindergarten, elementary* or *secondary school teacher* in the B.C. public school system. A Standard Teaching Certificate is awarded to individuals who complete a program of study that includes at least four years of post secondary professional and academic courses, including basic teacher education, as approved by the College. A Professional Certificate is awarded to individuals who complete a five-year Bachelor of Education (BEd) program or a four-year university degree and a basic teacher education program.

Programs that qualify a person to teach elementary school are available at several public universities. A BEd (Elementary) is offered by Malaspina University College, Okanagan University College, College of the Rockies and University College of the Cariboo.

The University of British Columbia (UBC) also offers a BEd (Elementary). This program includes a specialization in French, as well as a Native Indian Teacher Education Program for native students who wish to teach at the elementary level.

The University of Victoria (UVic) offers a BEd (Elementary), and students may begin their studies at a college and transfer to UVic in their second or third year. Partnership programs with Malaspina University College and Okanagan University College offer the first four years of this program with completion at UVic. UVic has a two-year professional program for students who have already completed an undergraduate degree and who wish to teach elementary school. Simon Fraser University (SFU) also has a one-year professional development program in education.

To teach in a public secondary school in B.C. applicants are encouraged to complete a bachelor's degree or equivalent with academic work in two teachable subject areas (subjects widely taught in the secondary school system), as well as a teaching methods course in each subject. UBC offers a two-year program for students who have accomplished this and have included English courses and courses in Canadian Studies in their degree and wish to go on to teach secondary school. Experience working with young people of the age the student wishes to teach, including as a volunteer, is also recommended prior to application. This program is also available in French.

In addition, UBC offers a Technology Education Program (in conjunction with the British Columbia Institute of Technology) for those who wish to teach technology at the secondary school level, and a Continuing Teacher Education Diploma, which allows those working in the field to pursue an area of specialization. UVic offers a BEd for students who wish to teach art, music or physical education at the secondary school level and a two-year professional program for students who have completed an undergraduate degree. Standard certification is granted after the first year of the professional program and a BEd after the second year.

SFU has a BEd program for those who wish to teach elementary or secondary public school. Each student's program must consist of three components. These components include a major concentration or two minors from the arts, sciences, applied sciences or business administration faculties, a minor in education and a professional development program.

In most school systems *school counsellors* are also certified teachers. A bachelor's degree followed by a master's degree in counselling psychology, psychology or social work is the minimum educational requirement. A doctorate in counselling psychology may be advisable. Specific requirements vary between school districts. UBC's Department of Counselling Psychology offers both a master's and a doctoral degree in this field. Applicants to the master's program must have, in addition to a bachelor's degree, three years of paid or volunteer experience working with people. SFU's Department of Education offers a master's degree in counselling psychology with emphasis on counselling in educational settings. UVic's Faculty of Education offers a master's degree in arts (counselling psychology) and a master's degree in education (counselling or education psychology). UVic , UBC and the University of Northern B.C. offer programs leading to a master's degree in social work.

Those interested in teaching or counselling in the public school system should have a strong interest in helping others as well as an ability to inspire respect, trust and confidence. Good communication and analytical skills, knowledge of computers, adaptability and flexibility are also important. Patience, creativity, an active mind and an interest in reading are important. Prospective teachers need to be able to organize and work independently. A commitment to ongoing education and an active interest in new technologies as they relate to education are also necessary.

Working Conditions

Including time spent performing work duties outside the classroom or counselling office, many *secondary* and *elementary school teachers* and *counsellors* work in excess of 40 hours a week. Most work the conventional 10-month school year with two months off during the summer and two weeks off during Christmas/New Year holiday season. During the summer, these workers can either work at other jobs, travel or pursue other interests. Some choose to enroll in post secondary courses or workshops in order to continue their education or update their skills.

Helping children and students in their teens to learn new skills, work through personal or academic challenges and develop a capacity for learning can be very rewarding. However, teaching can be stressful, and there can be frustration also if dealing with unmotivated and disruptive individuals.

In 1995 the average annual earnings for all workers in this group were $38,900. Full-time, full-year teachers received an average of $47,800 in earnings. Those working in secondary schools had earnings that were slightly higher than the average, while those in elementary schools had earnings that were slightly lower.

This is a very large occupational group with the number of employed workers having increased from 37,800 in 1990 to 48,000 in 1998. About 59% of this group are elementary school or kindergarten teachers, 37% are secondary school teachers, and 4% are school or guidance counsellors.

At less than 1%, self-employment is almost non-existent for this group. About 22% work part time (compared to the B.C. all-occupation average of 26%) while unemployment is well below the all-occupation average.

Nearly all (99%) of this group are employed in education. Workers in this occupational group are spread out more evenly throughout the province than in many occupations, with 53% located in the Lower Mainland, 19% on Vancouver Island, 17% in the Okanagan-Kootenay and 11% in Northern B.C.

Not surprising for a profession that has traditionally been staffed by women is the fact that women currently account for slightly more than two-thirds of these workers in B.C. Their representation is even greater (81%) among elementary school and kindergarten teachers, but is substantially lower (49%) among secondary school teachers. The average age for these workers is 42, compared to the overall average for B.C., which is 38. The proportion of workers in the 45 to 54 age group (36%) is higher in this occupational group than the all-occupation average for B.C. (21%).

Employment Prospects

According to the Canadian Occupational Projection System (COPS) the employment outlook for this occupational group is for annual growth of 0.6% between 1998 and 2008, which is much slower than the all-occupation average. This is a very large occupational group, and despite the low growth rate, there will still be a large number of employment openings. Approximately 22,760 jobs will become available during this time. Of these, 87% will be the result of workers retiring.

Although this group has a lower rate of unemployment than the all-occupation average, there are a large number of teachers who are underemployed or working in other fields. There are also a substantial number of education graduates of post secondary institutions moving to B.C. from out of province. As a result, the number of qualified individuals far exceeds the number of work opportunities. Competition for employment is intense, particularly in the larger population centres.

Despite the current competition for employment, there will be a steady increase in the need for new teachers. Since 36% of teachers are in the 45 to 54 age group that is nearing retirement, the need to replace those retiring will increase over the next ten to fifteen years. Recently there have not been enough education graduates in B.C. to fill available positions. In 1998, for example, only 1,200 Bachelor of Education degrees were awarded by the province's major universities, while 2,135 new teachers were required by B.C.'s public school boards. As well, provisions in Year Three of the collective agreement (2000-2001) call for 400 more primary teachers and 88 more Learning Assistant teachers.

As a result of the current competition, education courses at post secondary institutions place an increasing emphasis on versatility and flexibility. In addition, fields such as special education and ESL (English as a second language) continue to grow. Between 1990 and 1999 there was a 70% increase in special needs students to 49,902. The number of ESL (English as a second language) students requiring special services has more than doubled, going from 34,176 in 1990 to 76,917 in 1998. While competition remains strong, employment openings will be filled by those teachers and education graduates who can demonstrate their versatility and extra skills.

It has been projected that there will be 13,290 job openings in B.C. for *elementary* and *kindergarten teachers* between 1998 and 2008. Approximately 11,530 jobs, or 87%, will become available as the result of retirements. Industry sources indicate that currently there is a surplus of elementary teachers in Northern and rural areas of B.C. However, demand for French Immersion, French as a second language, music and special education teachers does exist throughout B.C.

Projections indicate that there will be 8,460 jobs available for *secondary school teachers* between 1998 and 2008. Of these available jobs, 7,340, or 87%, will be the result of retirements. Industry sources report that currently there may be a shortage of these workers in Northern and rural areas of B.C. Advanced math, physics and chemistry teachers are in demand in all areas of B.C. As the baby boomer generation enters into retirement over the next decade, the shortage will extend into other educational areas. These are expected to include business education, technology education, home economics, special needs and English as a second language.

The expansion of vocational training has opened up new opportunities for secondary teachers in such areas as administration, business, office management, agricultural technology, food services, restaurant and hotel service and management, applied arts, applied chemistry, environmental studies, construction, forestry, pulp and paper, drafting, mechanics, textile and clothing production, health and social services. Applicants who have expertise or experience in these areas have an advantage when applying for secondary school teaching positions.

New graduates typically start work on a substitute list, in part-time positions and in maternity leave replacement. They then move into regular full-time work. Newly hired permanent teachers generally have two and a half years of experience teaching, usually as teachers on call.

Between 1998 and 2008, approximately 1,010 jobs will become available for *guidance counsellors*, 87% of these being the result of retirements. As is the case with teachers, the employment outlook for guidance counsellors is not expected to include much growth. However, some factors might improve this negative forecast. A greater focus on intervention with students susceptible to difficulties, such as drop-outs or those with special curriculum needs, might increase demand. Since these groups form a notable segment of the student population, it is a possibility (although not a certainty) that greater resources may be allocated for the services of guidance counsellors.

Career progressions for guidance counsellors vary by counselling field. These workers can move to larger schools, become directors or supervisors of counselling, or work in guidance personnel services. With further graduate education, these workers can become counsellor educators, counselling psychologists or school administrators.

Additional Information

British Columbia Teachers' Federation
http://www.bctf.bc.ca

Related Occupations

secondary school teachers (4141):

- elementary and secondary school teacher assistants (6472)
- college and other vocational instructors (4131)
- teachers teaching life skills courses to disabled persons (in 4215 instructors and teachers of disabled persons)

elementary school and kindergarten teachers (4142):

- early childhood educators and assistants (6470)
- elementary and secondary school teacher assistants (6472)
- school principals and administrators of elementary and secondary education (in 01/09 middle and other management)
- teachers teaching life skills to disabled persons (in 4215 instructors and teachers of disabled persons)

school and guidance counsellors (4143):

- family, marriage and other related counsellors (4153)
- social workers (4152)
- school psychologists (in 4151 psychologists)

Psychologists

NOC 4151

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	900	1,740	2,310

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
570	480	1,050

Annual Growth 1998-2008 2.9%

Main Industries of Employment

Physicians, and Health Practitioners and Medical Labs	56%
Other Health and Social Services	13%
Hospitals	12%

Employment by Region

Lower Mainland	70%
Vancouver Island	21%
Northern B.C.	1%
Okanagan/Kootenay	7%

Self-employment 47%

Nature of the Work

Psychologists diagnose psychological and emotional disorders, counsel clients and provide therapy as well as research and apply theory relating to behaviour and mental processes. Psychologists work in private practice or in institutions, such as clinics, correctional facilities, hospitals, rehabilitation centres, schools and universities.

Main Duties

Psychologists examine behaviour, diagnose psychological and emotional disorders, counsel clients and provide therapy. They also counsel individuals and groups to achieve more effective personal, social and vocational development and adjustment. In addition, they apply psychological theory and principles regarding behaviour and mental processes, such as learning, memory, perception and language development. They formulate hypotheses and experimental designs, review literature, conduct studies and publish research papers.

Example Titles

- experimental psychologist
- clinical psychologist
- research psychologist

Education and Training

A career as a *psychologist* or as a university professor and researcher in this field can require up to 10 years of formal education beyond high school. This includes completion of a four-year bachelor of arts or science degree in psychology then a two-year master's degree followed by a four-year doctoral degree. Although a master's degree is the minimum requirement, a doctoral degree (PhD) is required for most employment in this field. Clinical and counselling psychology may require a one-year internship in an approved, applied setting as part of the PhD. To be a licensed psychologist in B.C., the B.C. Psychological Association requires completion of a PhD in psychology, one year of postgraduate work experience and one year of B.C. residency.

Undergraduate and graduate programs in psychology are available at public universities in British Columbia. Most university colleges offer up to two years of university transfer courses in psychology. A strong arts and science undergraduate education, advanced computer skills and programming and computer mathematics are all useful preparation for a career in psychology.

Psychologists should have a genuine, non-judgmental interest in people, be emotionally stable and mature and have the ability to lead and inspire others. Patience and perseverance are also necessary because treatment results are sometimes delayed. Excellent interpersonal skills are essential. Analytical skills, an ability to use computers and adaptability are fundamental to success in this occupation.

Areas of specialization within graduate studies in psychology include biopsychology, clinical, life-span development, forensic, perception and cognition, personality, social, environmental, psychometric and neuropsychology. Almost all of these areas are offered at the University of British Columbia, although other public universities in B.C. have several options. Psychologists become specialists in a particular area by acquiring training and experience.

©Stone/Vancouver

Working Conditions

A *psychologist's* specialty and place of employment determine working conditions. For example, clinical, school and counselling psychologists in private practice have pleasant, comfortable offices and set their own hours. However, they often have evening hours to accommodate their clients. Those employed in hospitals, homes and other health facilities often work evenings and weekends. Psychologists employed by academic institutions divide their time among teaching, research and administrative responsibilities. Some maintain part-time consulting practices as well. Young psychologists are often forced by the precarious nature of employment to adapt to working in several branches of the profession.

When reading and writing research reports, psychologists usually work alone. Many experience the pressures of deadlines, tight schedules and overtime work. Their routine may be interrupted frequently. Travel may be required to attend conferences or conduct research.

In 1995 the average annual earnings for all psychologists in B.C. were $44,400. Full-time, full-year psychologists received an average of $54,000 in earnings. The number of employed individuals in this group rose from 900 in 1990 to 1,740 in 1998.

Self-employment for this group stands at 47%, which is well above the all-occupation average of 15%. About 30% work part time. By comparison, the all-occupation rate for part-time employment in B.C. is 26%. As is the case for most self-employed professionals, unemployment is well below average.

In addition to working in offices of psychologists (56%), substantial proportions of this group are also employed in other health and social services (13%), education (12%) and hospitals (12%).

The proportion of psychologists in the southwestern part of the province is much higher than the all-occupation average, with 70% located in the Lower Mainland and 21% on Vancouver Island. The Okanagan/Kootenay is home to 7% of this group, while Northern B.C. is underrepresented for its population density.

There are slightly more women (58%) than men employed in this occupation. As is often expected in an occupation for which the educational requirements take a substantial number of years to complete, there are few workers (1%) under the age of 25. The proportion of this group aged 25 to 34 is also substantially lower than average, while the representation of the age groups 45 to 54 and 55 to 64 is high. In addition, the number of individuals who continue to work after the usual retirement age is 6%, compared to the B.C. all-occupation average of 2%.

Employment Prospects

Employment opportunities for *psychologists* in B.C. are projected to grow at an annual rate of 2.9%, which is much faster than the all-occupation average, according to the Canadian Occupational Projection System (COPS). Approximately 1,050 employment openings are projected in B.C. between 1998 and 2008. Projections indicate that 480 of these, or 46%, will be the result of workers retiring.

Although there is a growing interest in the rehabilitation of prisoners and in programs that combat drug dependency, family violence, crime and other societal problems, growth in government employment for psychologists is limited because of tight government budgets. For similar reasons, job growth in hospitals and other health and social services is expected to be weak. In contrast, job growth will occur in education, in the private practices of health care practitioners and in medical laboratories. The job outlook is positive for clinical psychologists.

After several years of experience, some psychologists (usually those with doctoral degrees) may enter private practice or set up private research or consulting firms. Nearly half of all psychologists are self-employed in private practice.

Opportunities will be best in private practice. Increased counselling and testing of children and the growing number of insurance companies providing full or partial coverage for psychological treatment have fostered the growth of private practice. Widespread corporate restructuring has also boosted demand for industrial and organizational consulting psychologists. The increase in employee assistance programs, which offer support to stress-affected employees and help with personal problems, should also contribute to job growth. Companies are also expected to increase their use of psychologists in market evaluation survey design, statistical analysis and research.

Despite this rather promising profile, many analysts point out that few permanent positions are currently available to psychology graduates. Most graduates are only offered contractual agreements for set periods of time. As a result, many young psychologists must combine various part-time positions by dividing their time, for example, between public or para public institutions, private practice and teaching.

The North America Free Trade Agreement (NAFTA) makes it possible for psychological services to move between the United States, Canada and Mexico. NAFTA discussions resulted in a common criterion for recognizing skills and standardizing professional training and practice. Currently, Canadian psychologists require a Provincial licence to practise in the United States and Mexico. NAFTA could result in increased competition and fewer jobs and/or lower wages for B.C. psychologists if foreigners are more cost-effective. Conversely, if B.C. psychologists can offer better and more efficient service, opportunities for them could grow more quickly in the U.S. and Mexico than in the domestic market.

Psychologists may progress to administrative positions in hospitals or the school system, or become specialized in a particular area (for example, ergonomics) through experience and training. They may also teach psychology at universities and colleges. However, obtaining permanent full-time teaching positions has become increasingly difficult.

Opportunities for doctoral graduates in areas with an applied emphasis, such as clinical, counselling, health, and educational psychology, should be particularly good. Psychologists with extensive training in quantitative research methods and computer science may have a competitive edge over applicants without this background.

Graduates with a master's degree in psychology qualify for positions in schools and industrial-organizational psychology. Those with several years of industrial experience may obtain jobs in consulting and marketing research. Others may find jobs as psychological assistants in the community mental health field, which often requires direct supervision by a licensed psychologist. Still others may find jobs involving research and data collection and analysis in universities, government or private companies.

Very few, if any, work opportunities in the field of psychology will exist for bachelor's degree holders. They may assist psychologists and other professionals in community mental health centres and correctional programs. Some may find jobs as assistants in rehabilitation centres or in jobs involving data collection and analysis. Others may work in related fields, such as marketing research.

Additional Information
Provincial/Territorial licensing requirements for psychologists can be found at the Canadian Psychological Association Web site http://www.cpa.ca/licensing.html

Related Occupations
- psychiatrists (in 3111 specialist physicians)
- psychology research assistants, non-university (in 416 policy and program officers, researchers and consultants)
- psychologists who teach at universities (in 4121 university professors)
- psychometrists (in 416 policy and program officers, researchers and consultants)

> ***The increase in employee assistance programs, which offer support to stress-affected employees and help with personal problems, should also contribute to job growth. Companies are also expected to increase their use of psychologists in market evaluation survey design, statistical analysis and research.***

Social Workers

NOC 4152

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	2,980	4,270	5,070

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
800	1,090	1,890

Annual Growth 1998-2008 1.7%

Main Industries of Employment

Other Health and Social Services	40%
Provincial and Territorial Administration	26%
Hospitals	19%

Employment by Region

Lower Mainland	52%
Vancouver Island	21%
Northern B.C.	9%
Okanagan/Kootenay	17%

Self-employment 3%

Nature of the Work
Social workers treat social functioning difficulties, provide counselling, therapy and referral to other supportive social services, and evaluate child development and the adequacy of child care. They are employed by hospitals, school boards, social service agencies, welfare organizations and correctional facilities, or they may work in private practice.

Main Duties
Social workers interview clients individually, in families, or in groups to assess their situation and problems and to determine the types of services required. They provide counselling and therapy to assist clients in developing skills to deal with and resolve their social and personal problems. They also plan programs of assistance for clients, including referral to agencies that provide financial assistance, legal aid, housing, medical treatment and other services, and they investigate cases of child abuse or neglect and take authorized protective action when necessary. In addition, they serve as members on interdisciplinary teams of professionals working with client groups and act as advocates for client groups in the community. They develop or advise on social policy, conduct social research and assist in community development. They may supervise other social workers.

Example Titles
- social work supervisor
- coordinator of social work
- medical social worker
- psychiatric social worker

Education and Training
It is mandatory to be registered with the Board of Registration for *social workers* to use the title of "Registered Social Worker" or to represent oneself as a social worker in the

province of British Columbia. However, registration is not mandatory in order to be employed in the field of social work in B.C.

Social work positions with the provincial government are generally filled by people who have a university social work degree. Since 1995 a Bachelor of Social Work (BSW) is required for social workers hired by the B.C. Ministry for Children and Families. Advanced or administrative positions may require a Master of Social Work (MSW). Experience through volunteer work is a strong asset when pursuing a social work career, and expertise gained on the job is important for career advancement.

The University of British Columbia (UBC) offers an undergraduate program leading to a BSW and an MSW with emphasis on clinical practice and/or social development. Admission to the BSW program in the School of Social Work requires completion of two years of university courses. The next two years of education within the School integrate academic work with supervised social work practice in a social work agency. The MSW program at UBC can be completed in 12 months on a full-time basis, and part-time study is also available. Admission to the MSW program requires a BSW or a bachelor's degree equivalent to a BSW, high academic standing, a plan of study, experience in the social welfare field and letters of reference.

At the University of Victoria (UVic) School of Social Work the BSW curriculum stresses an analysis of power differences. The goal of the program is to develop critically reflective, generalist social work practitioners who are able to respond to human problems at both the individual and the social structural level. The program is available on campus as well as through distance education. Admission requires completion of two years of university courses in arts and science. Students who have completed a college human/social services certificate or diploma or a related undergraduate degree may be eligible for advanced credit. Admission is limited and competitive. UVic also offers a Multidisciplinary Master of Policy and Practice in Health and Social Service. Social work students completing this program of study receive an MSW. Admission requirements include a BSW and two years of relevant experience.

The University of Northern British Columbia (UNBC) offers a social work program leading to a BSW. The program emphasizes social work in northern and remote areas relating to First Nations peoples, women and human services as well as community practice and research. Admission to the program requires completion of two years of university courses. Under collaborative agreements between UNBC and three northern community colleges (College of New Caledonia, Northern Lights College and Northwest College), students who have completed human services training programs at those colleges are eligible to receive advanced credit. Students who have completed a human services training program at other colleges may be eligible for discretionary advanced credit. A one-year MSW program is available on a full- or part-time basis at UNBC. A BSW and two years of full-time human services experience lead directly into the MSW Program.

BSW programs are also available at the University College of the Cariboo (UCC), University College of the Fraser Valley (UCFV) and Okanagan University College (OUC). The program at UCC emphasizes the general practice of social work in rural communities and small towns in the interior and north of B.C. The program at UCFV prepares graduates for careers in a multicultural environment. The program at OUC prepares students to work in a wide range of government and voluntary organizations. Admission to these programs usually requires first and second year university or graduation from a two-year social service worker diploma program. Malaspina University College offers a BSW University Block Transfer program in the field of legal and social services. Selkirk College offers a certificate and a degree program in social work, which can be used toward a BSW. In addition, Nicola Valley Institute of Technology offers a First Nations Social Work Diploma in conjunction with the UCC and a bachelor's degree in social work in conjunction with UVic.

Social workers require empathy and should be able to establish rapport with a wide range of people. At times they require mediation and negotiation skills. Technical skills in the area of child protection and an awareness of the needs of mentally and physically disabled people in social service settings are vital. For more advanced positions, supervisory and management skills are needed.

Working Conditions

Most *social workers* have a standard work week. However, they may work some evenings and weekends to meet with clients, attend community meetings and handle emergencies. Some, particularly those employed by non-profit agencies, work part time. Social workers spend most of their time in an office or residential facility, but also may travel locally to visit clients or meet with service providers.

While satisfying, the work can be emotionally draining. Understaffing and large caseloads add to the pressure in some agencies.

In 1995 the average annual earnings for all workers in this occupational group were $36,700. Full-time, full-year social workers received an average of $42,600 in earnings. The number of employed workers rose from 2,980 in 1990 to 4,270 in 1998.

At 3%, self-employment is not common among social workers, compared to the self-employment average for all workers in the province (15%). Nevertheless, experts in the field believe that the amount of self-employment will increase. About 16% of those employed in this group work part time, well below the all-occupation average of 26%. Unemployment is lower than the all-occupation average, and this work is not generally considered to be seasonally affected.

The largest concentrations of social workers are employed by health and social services (40%) and the provincial government (26%). There are also a fair number working in hospitals (19%) and for local governments (5%).

The distribution of these workers throughout the province is very close to the all-occupation average proportions, with

52% in the Lower Mainland, 21% on Vancouver Island, 17% in the Okanagan/Kootenay and roughly 9% in Northern B.C.

Women account for 75% of this occupational group. The average age of these workers is 41, slightly higher than the all-occupation average for B.C., which is 38. Compared with the all-occupation average figures, the proportionate representation for workers in this group under the age of 25 is low (2% compared to 15%) while it is noticeably higher for those aged 35 to 44.

Employment Prospects

According to the Canadian Occupational Projection System (COPS), employment for *social workers* in B.C. should grow at an annual rate of 1.7%, or about as fast as the all-occupation average. Approximately 1,890 total employment openings are projected in B.C. between 1998 and 2008. Of these openings, 58% or 1,090 are projected to be the result of workers retiring. There will be some limited growth in public sector positions, but it is anticipated that most of the growth will be in private agencies.

Employment will not grow as fast as the growing demand for community and social service workers (NOC 4212) despite the growing demand for social workers in private social service agencies. The need to keep costs down will encourage agencies to hire community and social service workers (NOC 4212) who have less education and are paid less and, as a result, contribute to reduced wage costs.

Employment opportunities for social workers may also exist in related fields that are growing and in demand. For example, in health care the aging of the population is predicted to generate opportunities in gerontology. The employment of social workers in hospitals is projected to grow due to greater emphasis on discharge planning. Discharge planning promotes early discharge of patients by ensuring that the necessary medical services and social supports are in place when individuals leave the hospital. As a result, social workers will also be employed in home health care services and the growing number of assisted living and senior living communities.

The aging of the baby boom generation will increase the demand for social workers. These workers will deal with depression and mental health concerns regarding mid-life, career problems and other personal and professional difficulties. There also has been development in new areas of psychosocial intervention and evaluation. These include the setting up or overhaul of programs for protecting mentally and physically challenged adults, the regulation of international adoption procedures and the provision of family mediation services.

Although dependent on government funding, the demand for school social workers will rise. The need to respond to the adjustment problems of children who have difficulty adapting to school, such as immigrants and children from single-parent families, is an example of demand pressure. Continued emphasis on integrating disabled children into the general school population will lead to more jobs in this area. Young people dropping out of school, single-parent families, increased violence and social integration problems are other factors requiring the involvement of social workers in the community.

Industry experts in this field expect the number of opportunities in self-employment, contract work and part-time work to increase. Opportunities for social workers in private practice will grow as a general increase in affluence results in more people being able to afford private professional help. Employee assistance programs and training seminars are growing in popularity with corporations. Social workers in private practice will continue to be used on a contract basis to provide these programs to corporation employees.

Competition for social worker jobs is strongest in cities where demand for services is often highest, training programs are prevalent and interest in available positions is strongest. Rural areas often find it difficult to attract and retain qualified staff. Therefore, opportunities in rural communities will be better.

Social workers may progress to administrative positions in hospitals or the school system or to particular areas of specialization with experience and training. Those who have graduate-level degrees may move into teaching and research positions at colleges or universities or move into social planning in government. With experience and additional training, community and social service workers (NOC 4212) may progress to professional social services positions, such as social workers (NOC 4152), as well as positions within family, marriage and other related counsellors (NOC 4153) or probation and parole officers and related occupations (NOC 4155).

Additional Information

British Columbia Association of Social Workers
http://www.bcasw.org

Canadian Association of Social Workers
http://www.casw-acts.ca

Related Occupations

- community and social service workers (4212)
- family, marriage and other related counsellors (4153)
- managers in social, community and correctional services (in 01/09 middle and other management)
- school and guidance counsellors (in 414 secondary and elementary school teachers and counsellors)

Social workers require empathy and should be able to establish rapport with a wide range of people.

Family, Marriage and Other Related Counsellors

NOC 4153

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	3,630	6,130	7,420

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
1,290	1,580	2,870

Annual Growth 1998-2008 1.9%

Main Industries of Employment

Other Health and Social Services	69%
Physicians, and Health Practitioners and Medical Labs	8%
Other Service Industries	6%

Employment by Region

Lower Mainland	46%
Vancouver Island	26%
Northern B.C.	10%
Okanagan/Kootenay	18%

Self-employment 14%

Nature of the Work

Family, marriage and *other related counsellors* assist individuals and groups of clients to identify, understand and overcome personal problems and achieve personal objectives. They are employed by social service agencies and hospitals, or they may work in private practice. Included in this occupational group are family court counsellors who are employed by the Ministry of Attorney General or work in private practice.

Main Duties

Family and *marriage counsellors* interview clients, prepare case histories, assess problems and develop and implement counselling and intervention programs to assist clients in determining goals and means of attaining them. They counsel clients, provide therapy, evaluate the effectiveness of counselling programs and evaluate clients' progress in resolving identified problems and movement towards defined objectives, and they follow up results of counselling programs and clients' adjustments. They may supervise other counsellors, social service staff and assistants, and they may also provide public education and consultation to other professionals or groups regarding counselling services, issues and methods.

In addition to performing these duties, family court counsellors investigate and assess the relationship between children and parents, manage caseloads according to time parameters, prepare custody and access reports for the court, and assist clients with enforcement and variations of court orders.

Example Titles

- bereavement counsellor
- family counsellor
- family court counsellor
- vocational rehabilitation counsellor
- sex therapist
- addictions counsellor
- youth counsellor
- marriage counsellor
- rehabilitation counsellor

©Stone/Vancouver

Education and Training

There are currently no regulations governing those working in this field in B.C. although this situation is under review by the Health Professions Council. At the moment, educational qualifications vary greatly for people practising as *family* and *marriage counsellors.*

In some work settings a two-year college social services diploma or a bachelor's degree in psychology or social work, plus several years' related experience, may be sufficient. However, a master's degree or a doctoral degree in counselling or in a related discipline plus one or two years of supervised practice, are increasingly required by employers. In some settings, professional certification is required.

Undergraduate programs in social sciences are available at all B.C. universities. A number of university colleges offer undergraduate degrees in social sciences and one- or two-year programs that allow transfer to the universities. The University of British Columbia and the University of Victoria offer master's and doctoral degrees in counselling psychology. Applicants must have a bachelor's degree and at least three years' paid or volunteer experience in jobs that involve working with people. Simon Fraser University also offers a master's degree in counselling psychology with emphasis on counselling in educational settings. The University of Northern British Columbia has an educational counselling focus within a master's degree in education. Many continuing education departments at colleges and universities, as well as the Justice Institute of B.C., provide professional development courses for counsellors on such topics as addictions, child abuse, sexual assault, mediation and various therapeutic approaches.

Prospective counsellors should have a genuine interest in helping people resolve problems and should be able to listen empathetically and without judgement. They need to be emotionally mature, patient and tolerant of other people's beliefs and values. An ability to manage time and stress effectively is important. Creativity is often an important attribute.

Working Conditions

Workers in this occupational group usually carry out their duties in private offices that allow for confidential discussions with clients. *Counsellors* generally work 35 to 40 hours a week, but some counselling sessions may have to be conducted in the evenings or on weekends to accommodate the schedules of working clients or those with children in school.

Some travel may be necessary to conduct sessions in clients' homes or to meet with service providers. Counsellors must be prepared to deal with individuals under stress and to work in difficult social situations. They should be sensitive and understanding but need to remain emotionally detached and objective in order to be effective in their role as a counsellor.

The work can be satisfying but also very emotionally draining. Understaffing and heavy caseloads at some agencies can contribute to the pressures of the work.

In 1995 the average annual earnings for all workers in this occupational group were $26,200. Full-time, full-year workers received an average of $34,100. The respective all-occupation averages in the province in 1995 were $27,900 and $39,400. According to a recent graduate survey, entry-level workers in these occupations earned an average of $2,075 per month for full-time work. This translates into about $24,900 a year for recent college graduates who find full-time, full-year work in this field.

This is a large occupational group. The estimated number of employed workers rose from 3,630 in 1990 to 6,130 in 1998, an increase of over 60%.

About 14% of workers in this occupational group are self-employed, and 30% work on a part-time basis, figures that are close to the all-occupation averages of 15% and 26% respectively. Unemployment is a little lower than the provincial average, and seasonal fluctuations do not influence employment in this line of work.

Most of these counsellors are employed in health and social services (69%). Other employers include physicians, health practices and medical laboratories (8%), service industries (6%), hospitals (5%) and provincial and local governments (6%).

This group is well-represented throughout the province, with 46% located in the Lower Mainland, 26% on Vancouver Island, 18% in the Okanagan/Kootenay and 10% in Northern B.C.

Women account for 72% of these workers. The average age of these workers is 41, slightly higher than the all-occupation average of 38. Compared with the all-occupation average proportions, the representation of workers under the age of 25 is significantly lower, and the representation of those aged 35 to 44 is higher.

Employment Prospects

The Canadian Occupational Projection System (COPS) forecasts an annual growth rate of 1.9% between 1998 and 2008 for *family* and *marriage counsellors*, which is faster than the all-occupation average. Approximately 2,870 positions will become available over this period of time. Of these positions, 55% or 1,580 will be due to openings from retirements. Although these occupations experienced strong growth in the early 1990s, government restraints in the area of social programs and health services will limit employment growth for the near future.

Some industry observers anticipate that part-time and contractual work in this field will increase. The industry perspective is that there is currently a surplus of practitioners in B.C., but a shortage could result if these occupations become regulated. The regulation of family or marriage counsellors has not taken place at time of writing. However, this is under review by the Health Professions Council of B.C. Currently, family court counsellors must complete the Family Justice Counsellor Certificate Program at the Justice Institute of B.C.

Health and social services will continue to be the leading employer of family and marriage counsellors, while employment opportunities in provincial and local governments are expected to decline. Addiction counselling and youth counselling are expected to continue to offer opportunities. Few qualified practitioners are available in many of the small, northern towns. As there are often opportunities for addiction counselling and youth counselling in these areas, a willingness to live in rural communities will increase the probability of obtaining employment. The majority of jobs are with non-profit organizations that pay at the lower end of the wage scale for these occupations. Most require some amount of related experience or specialized education, such as about drugs or alcohol. Workers with experience usually have the best success in finding work in these northern areas.

Government services are being contracted out increasingly, and as a result, employment prospects with private practices are expected to expand. As well, employers are expanding employee assistance programs to provide assistance to employees dealing with various personal and stress-related problems. Employers are aware that these problems reduce productivity in the work place. Consequently more firms will pay for counselling on behalf of their employees through benefit plans. In addition, as society continues to focus on ways of developing mental well-being, such as alleviating family-related stress and dealing with addictions, private citizens will increasingly seek private practioners' help.

Despite the increase in demand for private practitioners, competition for clientele will be strong amongst private practitioners. As a result, they will continue to need to be familiar with business and marketing strategies. They should prepare to encounter competition not only from other counsellors but also from other mental health providers, such as psychologists (NOC 4151), social workers (NOC 4152) and psychiatrists (in NOC 3111 specialist physicians).

Family and marriage counsellors working in agencies have the potential to progress to supervisory or administrative positions. Some counsellors may choose to move into research, consulting or, with additional education, university or college instruction. Others may pursue private or group practice.

Additional Information

Justice Institute of B.C. http://www.jibc.bc.ca

Related Occupations

- employment counsellors (4213)
- managers in social, community and correctional services (in 01/09 middle and other management)
- school and guidance counsellors (in 414 secondary and elementary school teachers and counsellors)
- social workers (4152)

Probation and Parole Officers and Related Occupations

NOC 4155

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	540	600	680

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
80	150	230

Annual Growth 1998-2008 1.3%

Main Industries of Employment

Provincial and Territorial Administration	57%
Federal Administration	30%
Other Health and Social Services	11%

Employment by Region

Lower Mainland	58%
Vancouver Island	21%
Northern B.C.	11%
Okanagan/Kootenay	10%

Self-employment 0%

Nature of the Work

Probation officers monitor the conduct and behaviour of criminal offenders serving probation terms. They also monitor the reintegration of criminal offenders serving the remainder of sentences while conditionally released into the community on parole. *Classification officers* assess inmates and develop rehabilitation programs for criminal offenders who are incarcerated in correctional facilities.

These workers are employed by federal and provincial governments and work in the community and in correctional facilities. In British Columbia probation officers work for B.C. Corrections, whereas parole officers work for the National Parole Board. As well, in B.C. correctional institutions, the functions of classification officers and correctional officers are combined.

Main Duties

Probation officers interview offenders to prepare pre-sentence reports and assess offenders' prospects for successful reintegration into the community. They plan rehabilitation programs with offenders, establishing rules of conduct, goals and objectives, and they refer offenders to community and social service programs as required. They also supervise the terms of a probation order, as well as interview probationers and parolees regularly to evaluate their progress in accomplishing goals and maintaining the terms specified in their probation contracts and rehabilitation plans. In addition, they recommend remedial action or initiate court action when there is a willful failure to comply with terms of probation or parole.

Classification officers interview inmates to assess adjustment problems and develop suitable rehabilitation programs. They prepare classification reports recommending type of incarceration and types of interventions considered most beneficial for the rehabilitation of the inmates. They also plan rehabilitation programs with offenders, identifying needs and setting out goals and objectives, and they liaise with the inmates' families and contacts in the community to maintain established bonds outside of the institution. Furthermore, they advise and counsel inmates regarding their problems, and they evaluate their progress.

Example Titles

- probation officer
- youth worker, corrections
- institution case management officer
- parole officer
- classification officer, correctional institution
- case manager, corrections

Education and Training

A bachelor's degree in social work, criminology, sociology, psychology or other related social science discipline is required in order to be a *probation officer*. A second way to qualify is to complete two years of study at a recognized college or university in a social science field, then complete five years of related experience as a corrections worker or equivalent. Candidates with directly related experience are given preference. All applicants must be Canadian citizens or permanent residents of Canada.

In addition to academic requirements, all prospective probation officers must successfully complete a 12-week training program offered by the Corrections and Community Justice Division of the Justice Institute of British Columbia. Applicants must have good language skills and may be required to write a language proficiency exam. Selection is based on various exercises and interviews as well as a reference check. Police record checks are mandatory. Training addresses the law pertaining to sentencing, probation and

B.C. parole, B.C. Corrections policies, report writing and interviewing skills and the knowledge needed to work with special clients, such as sexual offenders and people with mental disabilities. Graduates of the program are granted certificates of achievement.

Probation officers should be calm and emotionally stable, with self-awareness, self-confidence and assertiveness. They should display leadership qualities and enjoy community work. Good oral and written communication skills are important as are abilities to organize and set priorities. They must be able to work with little direct supervision but also as a member of a team. Flexibility and familiarity with technological information systems are assets.

National parole officers require a bachelor's degree in sociology, psychology or criminology, or social work. A master's degree is usually an asset. Several years of experience as a correctional officer or case management officer, with successful completion of a university equivalency test, may substitute for formal education requirements.

Programs in sociology and psychology are available at public universities. Programs in social work are available through several B.C. universities as well as university colleges. Simon Fraser University offers a criminology degree program, and the University College of the Fraser Valley offers a Bachelor of Arts (BA) in Criminal Justice. Various colleges and university colleges throughout the province offer criminal justice and criminology diploma, certificate or university transfer options.

National *parole officers* must be mature individuals with good interpersonal skills. Strong verbal and written communication skills are necessary for writing and presenting reports. Parole officers need to be precise and able to work independently as well as with others. Flexibility and familiarity with technological information systems are valuable. Workers in these occupations should have a genuine concern for the well-being of others.

See the profile Other Occupations in Protective Service (646) for information on education and skills required by correctional service officers.

Working Conditions

Probation and *parole officers* usually carry out their duties in private offices that allow for confidential discussions with offenders. They generally work 35 to 40 hours a week, often in correctional institutions. Although measures are taken to ensure the security of workers in correctional institutions, parole officers occasionally can be exposed to threats from offenders. This work can be stressful and emotionally draining, and understaffing may add to the pressure. However, the work can also be very satisfying.

In 1995 the average annual earnings for all workers in this occupational group were $39,600, with the 69% who worked full time for the full year receiving an average of $44,800 in earnings. The respective all-occupation averages in the province in 1995 were $27,900 and $39,400. This is a very small occupational group. The number of employed workers rose from 540 in 1990 to 600 in 1998. None of these workers is listed as being self-employed. Relatively few (12%) work part time (compared to the all-occupation average of 26%), and unemployment is virtually non-existent.

The two largest concentrations of workers are employed by the provincial government (57%) and the federal government (30%), while the rest work in health and social services. Approximately 58% of these workers are located in the Lower Mainland, 21% are on Vancouver Island, 10% are in the Okanagan/Kootenay, and 11% are in Northern B.C.

Women account for 41% of this occupational group, close to the 46% of the overall B.C. labour force. Only 2% of the workers in B.C. are listed as being under the age of 25, compared to 15% of the all-occupation average, and the proportion aged 45 to 54 is higher than the average for all occupations. The average age of workers in this occupation is 42.

Employment Prospects

Employment for *probation* and *parole officers* in B.C. is projected to grow more slowly than the all-occupation average, at an annual rate of 1.3%, according to the Canadian Occupational Projection System (COPS). Approximately 230 jobs will become available in B.C. between 1998 and 2008. Projections indicate that of these jobs, 65% or 150 will come from the replacement of those who retire. Industry sources expect that there will be a need for an average of 12 adult probation officers per year (and up to as many as 25 per year) and between 15 and 25 youth probation officers per year, over the next eight years. There will be a greater opportunities for these workers in communities in Northern B.C.

The correctional system has been experiencing increases in pre-trial workloads for those in bail supervision. Between 1991 and 1998 remand (delayed trial) populations more than doubled, and community services bail supervision work more than tripled. Probation and conditional sentence caseloads grew 60% between 1990 and 1998.

Almost all positions in this field are funded by federal, provincial or municipal resources and grants. Funding constraints at all levels of government are projected to limit employment for probation and parole officers. As a result, permanent positions in this field are often hard to secure for new workers, and more often, positions that become available to those outside the system are for term or auxiliary jobs. Industry sources expect new federal and provincial funding in this area to increase over the next few years, and this may help address employment terms for new workers.

Adult probation officers are employed by the B.C. Corrections Branch of the Ministry of Attorney General. The Youth Justice Division of the Ministry for Children and Families employs youth probation officers. The National Parole Board also employs probation officers, but almost all of these workers progress to this position from other jobs, such as corrections officer, within the national justice system. The Justice Institute of British Columbia provides the training that qualifies potential workers for employment as either adult or youth probation officers. However, completion of either the adult or the youth Employment Readiness Program does not guarantee employment. After the completion of the program, the employers hold Public Service Panels to interview potential employees.

Employment for probation officers may be affected by enrolment restrictions at the Justice Institute. Currently the Justice Institute is running the Employment Readiness Programs between one and three times per year, with 12 to 20 students in each course. In addition, a pilot distance education version of the adult probation officer program is currently being run. The number of student positions for both the adult and youth Employment Readiness Programs is under review. Since potential workers must complete the Employment Readiness Program before employment, the number of available student positions will affect the number of potential workers for available jobs.

There has been a decline in crime rates in B.C. over the past few years, partly due to a changing demographic profile. The number of offenders serving jail sentences has grown at approximately the same rate as the general population of the province. However, the average age of offenders is increasing. With the aging of the population, and the fact that those over 45 years of age are less likely to be offenders, the crime rate is expected to continue to fall.

Despite the fall in the crime rate, most citizens of B.C. continue to feel that crime is increasing, especially among youth, that the justice system is too lenient and that respect for the law is in decline. Most citizens are also concerned about violent crimes and those that victimize children. There is strong support for tougher sentences, particularly for young offenders. There also is support, however, for alternatives to jail for non-violent, low-risk offenders. For the most part, citizens support alternative community-based sentencing rather than building more jails. Even those who want more jails built agree that different approaches are required for non-violent, low-risk offenders. This trend may have a favourable effect on the employment prospects for probation and parole officers.

After several years of experience probation officers may become Team Leaders. Team Leaders manage integrated youth service offices, supervising the youth probation staff and other professionals within a multidisciplinary service unit. Other promotion possibilities include youth justice consultant positions and middle or senior management positions.

With additional experience and in-house training, parole officers can progress toward supervisory positions. There will be opportunities to advance to middle management positions. According to industry sources, senior management positions will also become available in the next ten years. For example, it is expected that close to 70% of the senior managers in the Correctional Service of Canada are eligible to retire over the next five to seven years.

Additional Information

Justice Institute of B.C. http://www.jibc.ca

Ministry for Children and Families http://www.gov.bc.ca/mcf

Ministry of Attorney General http://www.gov.bc.ca/ag

Correctional Service of Canada http://www.csc-scc.gc.ca

Related Occupations

- community and social service workers (4212)
- correctional service officers (in 646 other occupations in protective service)
- social workers (4152)
- correctional services managers (in 01/09 middle and other management)

Policy and Program Officers, Researchers and Consultants

NOC 416

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	7,880	12,980	16,290

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
3,310	2,540	5,850

Annual Growth 1998-2008	2.3%
Main Industries of Employment	
Education	16%
Other Health and Social Services	12%
Other Business Services	11%
Employment by Region	
Lower Mainland	61%
Vancouver Island	22%
Northern B.C.	6%
Okanagan/Kootenay	10%
Self-employment	17%

Nature of the Work

This occupational group consists of a wide variety of workers involved in a broad range of research-related activities.

Natural and *applied science policy researchers, consultants* and *program officers* conduct research, prepare reports, provide consultation and advice and administer programs in a variety of areas related to the natural and applied sciences. They are employed by federal, provincial and municipal governments, private companies and advisory and consultant agencies, or they may be self-employed.

Economists and *economic policy researchers* and *analysts* conduct research and develop models to illustrate and forecast economic behaviour and patterns. They are employed by government agencies and private establishments to advise on matters such as finance, taxation and costs, international trade and labour, agricultural and industrial markets, resource allocation, and transportation.

Economic development officers and *marketing researchers* and *consultants* conduct research, develop policies and administer programs in order to promote industrial and commercial business investment or tourism as well as to promote commercial or industrial products and services. They are employed by government agencies, marketing firms and business associations, or they may be self-employed.

Social policy researchers, consultants and *program officers* conduct research, develop policy and implement or administer programs in areas such as employment, immigration, corrections, housing, labour, family services, foreign aid and international development. They are employed by government departments and agencies, consulting establishments, professional associations and other non-governmental organizations.

Health policy researchers, consultants and *program officers* conduct research, produce reports and administer health care policies and programs. They are also employed by government departments and agencies, consulting establishments, professional associations and other non-governmental organizations.

Education policy researchers, consultants and *program officers* conduct research, produce reports and administer elementary, secondary and post secondary education policies and programs. They are employed by government departments, school boards and education research institutes, or they may be self-employed.

Recreation and *sports program supervisors* and *consultants* oversee and administer recreation and sports programs and activities, provide consulting services, conduct research and develop programs and policies related to recreation, sports and physical fitness. They are employed by federal, provincial and municipal governments, health and sports organizations, community centres, recreational institutions and sport and fitness consulting firms, or they may also be self-employed.

Program officers who are unique to government are also included here. They are concerned primarily with the administration and operation of government institutions, such as Parliament, and activities unique to the operation of government, such as international relations, federal-provincial affairs and elections.

Finally, this group includes anthropologists, archaeologists, geographers, historians, linguists, political scientists, sociologists and other professional occupations in social science not elsewhere classified. They are employed throughout the public and private sectors.

Main Duties

The duties of *natural* and *applied science policy researchers, consultants* and *program officers* depend upon their area of specialty. *Ergonomists* conduct research and advise on interrelationships between persons, equipment and working or living environments to ensure products and work methods maximize safety, productivity and comfort. *Occupational hygienists* study and evaluate physical and chemical hazards and stresses in the workplace. They suggest changes to work processes and provide information to workers on methods to reduce the risk of specific occupational hazards.

Patent agents advise clients on elements of patent law and on the patentability of inventions. They also conduct patent searches, prepare patent applications and represent clients before the patent office. *Science policy* and *program officers* conduct research and advise on policies. In addition, they develop or administer programs related to transportation, communications, natural resources, agriculture, the environment, energy, land use and other scientific fields.

Economists and *economic policy researchers* and *analysts* conduct research and develop models to illustrate and forecast economic behaviour and patterns, and devise methods for the collection and analysis of data. They forecast production and consumption of agricultural products based on records of past crops, labour supply and general economic and agricultural conditions. They analyse factors that determine economic growth, and they advise government agencies on policies to increase economic activities. They study mathematical formulae and statistical techniques and apply them to the testing and quantifying of economic theories and the solution of economic problems.

Further, they study the nature of money, credit and credit instruments as well as the operation of banks and other financial institutions in order to develop monetary policies and forecasts of financial activity. They also examine problems related to the economic activity of individual companies, examine statistical data on the exchange of goods and services among nations, and forecast production and consumption of renewable resources as well as the supply, consumption and depletion of non-renewable resources. They conduct research on market conditions in local, regional or national areas to set sales and pricing levels for goods and services and to assess market potential and future trends.

Economic development officers and *marketing researchers* and *consultants* develop policies and administer programs to promote industrial and commercial business investment in urban and rural areas, and they conduct social or economic surveys on local, regional or national areas to assess development potential and future trends. They plan development projects with representatives of a wide variety of industrial and commercial enterprises, business associations and government agencies. They respond to enquiries from members of the business community concerning development opportunities, and they implement or oversee implementation of plans once developed.

They also review commercial or industrial development proposals and provide advice on procedures and requirements for government approval, and they conduct surveys and analyse data on the buying habits and preferences of wholesale or retail consumers. In addition, economic development officers and marketing researchers and consultants conduct comparative research on marketing strategies for industrial and commercial products, and they develop social and economic profiles of urban and rural areas to encourage industrial and commercial investment.

The duties of *social policy researchers, consultants* and *program officers* vary with their positions. *Social policy researchers* develop social programs, social legislation, or proposals based on demographic, social and economic analysis and the evaluation of pilot projects. *Home economists* conduct research and advise consumers on the selection and proper use of food products, textiles and other consumer goods. *Housing policy analysts* identify and assess economic, demographic and social developments and report on their implications for housing policy. *International aid and development project officers* plan, organize and administer foreign aid and international development policies and programs. *Social survey researchers* develop questionnaires, conduct surveys, analyse data, and compile and interpret statistics on social issues and policy areas.

Health policy researchers, consultants and *program officers* assist in developing government health policy by reviewing relevant literature, conducting interviews, collecting and analysing statistical data and providing advice to senior managers and officials. They maintain and update health information databases. They compile and analyse statistical information provided by private and public health care institutions and organizations and produce reports, and they monitor and evaluate health care programs operated by government departments and agencies or private organizations.

They also provide consulting services to clients in private establishments or government departments and agencies. They produce newsletters, magazines and other documents to provide information to association or organization members or the general public, and they present the views of an association or organization to politicians, government officials, the media or the general public.

Education policy researchers, consultants and *program officers* conduct research, produce reports, administer education policies and programs, evaluate curriculum programs, recommend improvements and develop the structure, content and objectives of new programs. They conduct statistical analyses to determine cost and effectiveness of education policies and programs. They provide ongoing professional development, training and consultative services to teachers, and they develop teaching materials and other resources for program delivery. They may also supervise the work of other education policy researchers, consultants or program officers.

Recreation and *sports program supervisors* and *consultants* also have varying duties depending on their positions. *Kinesiologists* conduct fitness tests and assessments and then design, develop and deliver fitness counselling and exercise programs. *Fitness consultants* provide expert advice and consulting services to community groups, corporations, schools and other organizations in the design and development of fitness programs and activities. *Recreation consultants* provide expert advice and consulting service to communities, corporations, institutions and other organizations in the design and development of recreation programs and activities.

Recreation, sports and *fitness policy analysts* conduct research and develop government policies related to recreation, sports and fitness. *Recreation and sports program supervisors* develop, plan and coordinate sports, fitness and recreation programs. *Sports consultants* provide expert advice and consulting service to sports associations and other organizations in the design, development and administration of sports programs and activities.

Some of the duties performed by *program officers unique to government* include advising politicians or diplomats on the social, economic and political effects of government decisions on other governments in Canada or abroad, planning inter-governmental meetings and conferences with officers of other municipal, provincial or federal governments, coordinating the logistics and administration of elections within constituencies and ensuring that electoral and voting procedures are followed. They also can coordinate administrative support services for legislative committees, royal commissions or tribunals, and plan logistics and oversee diplomatic protocol of official visits to Canada by foreign politicians and dignitaries. In addition, they explain Canadian foreign and domestic policies to governments and nationals of foreign countries.

Other professional occupations in social sciences entail a wide range of duties. *Anthropologists* conduct studies of the origin, development and functioning of human societies and cultures and of human evolution, changing physical characteristics and geographical distribution. *Archaeologists* study artifacts (objects and structures) to reconstruct past economic, social, political and intellectual life. *Geographers* study and analyse the spatial distribution and interrelationship of physical, biological and cultural patterns. *Historians* conduct research into one or more phases or aspects of past human activity and interpret and document findings.

Linguists study the origin, structure and development of languages and apply linguistic theory to problems in teaching, translation and communications. *Political scientists* conduct research into the theory, origin, development, interrelationships and functioning of political institutions, political movements and individual political behaviour. *Psychometricians* administer and interpret objective psychological tests. *Sociologists* study the development, structure, social patterns and interrelationships of human society. Specialization usually exists within each of these occupations.

Example Titles

natural and applied science policy researchers, consultants and program officers (4161):

- environmental issues lobbyist
- patent agent
- occupational hygienist
- industrial hygienist
- ergonomist
- scientific consultant
- energy policy analyst
- natural resource policy analyst
- transportation safety analyst

- transport program analyst
- environmental impact analyst
- supervisor, environmental program development
- fisheries analyst
- program officer, natural and applied science

economists and economic policy researchers and analysts (4162):

- investment economist
- economist
- agricultural economist
- development economist
- financial economist
- industrial economist
- labour economist
- tax economist
- economic analyst
- trade economist
- economist, natural resources
- industrial trade economist
- retail analyst

economic development officers and marketing researchers and consultants (4163):

- marketing analyst
- market researcher
- marketing consultant
- business development officer
- economic development officer
- industrial development officer
- tourism development officer
- tourism industry consultant

social policy researchers, consultants and program officers (4164):

- social survey researcher
- native issues lobbyist
- policy consultant, employment equity
- labour policy analyst
- community development officer
- housing policy analyst
- social policy researcher
- policy analyst, immigration
- child welfare policy analyst
- consumer advisor
- home economist
- human rights officer
- international aid and development project officer

health policy researchers, consultants and program officers (4165):

- consultant, health care
- consultant, drug and alcohol abuse
- research analyst, health policy
- consultant, mental health programs
- health care planner
- health promotion program officer
- planning officer, child health care programs
- policy development officer, nursing homes

education policy researchers, consultants and program officers (4166):

- coordinator, special education
- curriculum developer
- curriculum planner
- education consultant
- education policy officer
- education program coordinator
- education program officer
- supervisor, education policy
- education researcher

recreation and sports program supervisors and consultants (4167):

- camp coordinator
- recreation consultant
- sports consultant
- sport policy analyst
- fitness consultant
- kinesiologist
- fitness supervisor
- pool coordinator - recreation
- sports program supervisor

program officers unique to government (4168):

- federal-provincial relations officer
- officer, office of the speaker
- protocol officer
- officer, royal commission
- officer, standing or select committee
- foreign service officer
- intergovernmental affairs officer
- returning officer
- attache
- tribunal officer
- elections officer

other professional occupations in social sciences not elsewhere classified (4169):

- anthropologist
- sociologist
- archaeologist
- geographer
- historian
- linguist
- political scientist
- psychometrician

Education and Training

Generally, people working in this field possess at least a bachelor's degree in a relevant field, and many positions, especially management and academic positions, require completion of a master's or doctoral degree.

Specialists and *content experts* require education in their particular discipline and/or an education in administration. Several years of appropriate experience usually are necessary as well. *Program officers* require an education in areas such as educational administration, business administration, public administration, sociology or psychology, as well as some amount of experience as a researcher, consultant or program administrator or coordinator. *Economists* and *economic policy researchers* and *analysts* generally require at least a master's degree in economics or commerce. Marketing researchers require an education in economics, commerce, business administration or public administration. Some business experience is helpful.

Public universities and university colleges offer appropriate programs of study for people who wish to enter these fields. Most B.C. colleges offer university transfer courses in the relevant areas.

Although they must work well with others, people in these fields also must be able to spend long hours involved in independent study, analysis and problem solving. They must be able to work with detail and express themselves effectively, both orally and in writing. Knowledge of computers, mathematics, statistics and science is important. Adaptability to change is also important. Good management and sales skills are assets. To be successful, a willingness to continue learning is needed.

©Stone/Vancouver

Working Conditions

The majority of workers in this occupational group have structured, conventional working hours with occasional overtime for which there is usually no additional pay. They may work alone or as part of a research team as they gather information, write reports, prepare charts or use computers.

Workers in this group perform most of their duties in offices where they may have separate office space or work in an open area with others. If their work station is in an open area or is separated only by baffle boards or other temporary devices, they need to be able to function despite higher noise levels and other distractions.

Most of these workers must deal with the pressure of deadlines, and their tight schedules are often interrupted by telephone and in-person enquiries and special requests. These requests for data, letters, reports, meetings or presentations can come from supervisors, co-workers, business contacts from the public and private sectors or members of the general public. Workers in this group must handle enquiries effectively and courteously and still maintain their focus and concentration on the scheduled projects or tasks at hand.

Travel may be necessary in order to gather information or to attend meetings, workshops or conferences. Workers such as *recreation* and *sport programs supervisors* and *consultants* perform some of their duties at recreation or sport facilities, while *economic development officers* and *marketing researchers* and *consultants* may spend some of their time at local business establishments or with business groups.

Some workers in this group, such as *anthropologists, archaeologists* or *geographers* may be required to travel even further afield. These workers may have to conduct field work in foreign countries, which may mean adjusting to unfamiliar cultures or climates. They may also be required to travel to remote areas, live away from home for extended periods, work under difficult conditions and perform duties that require strenuous physical exertion.

In 1995 the average annual earnings for all workers in this occupational group were $33,500. Full-time, full-year workers earned an average of $45,000. Average earnings were highest among *economists* and *economic policy researchers* and *analysts* ($41,700 on average, $53,200 for full time, full year) although they make up only 4% of this occupational group. Those working in the *natural* and *applied sciences*, or in *education* as *researchers*, *consultants* and *program officers* earned $37,500 and $37,700 (on average) respectively, and $49,800 and $46,300 for full-time, full-year work. Earnings were lower among recreation and sports program supervisors and consultants ($21,700 on average, $32,800 for full-time, full-year) and among *other professional occupations in social science* not elsewhere classified ($23,400 on average, $42,700 for full-time, full-year). The respective all-occupation income averages in the province in 1995 were $27,900 and $39,400. A recent graduate survey found that those entering the sports and recreation sector earned approximately $2,070 per month and worked about 35 hours per week. Industry sources suggest that these entry-level earnings are lower for this segment of workers than those across the occupational group as a whole.

The number of employed workers in this group rose from 7,880 in 1990 to 12,980 in 1998. According to estimates, *health* and *social policy researchers, consultants* and *program officers* in B.C. account for 29% of this group, making them the largest occupation within this group.

Economic development officers and marketing researchers and consultants form 22% of the group. Another 16% are education policy researchers, consultants or program officers, 13% are recreation or sports program supervisors or consultants, and 12% are natural or applied science policy researchers, consultants or program officers.

About 17% of the entire occupational group are self-employed, but the proportions for specific occupations within the group vary somewhat. Self-employment is lower among researchers, consultants and program officers in health and social policy (10%) and among recreation and sports program supervisors and consultants (8%) and appears to be almost non-existent among program officers whose positions are unique to government. Self-employment is most common among economic development officers and marketing researchers and consultants (30%), natural and applied science policy researchers, consultants and program officers (28%), and other professional occupations in social science (for example, anthropologists, geographers, political scientists, sociologists, etc.) are also 28%. By comparison, the rate of self-employment across all occupations in B.C. is 15%.

About 20% of the entire group work on a part-time basis, and at 30%, this is even more common among recreation and sports program supervisors and consultants. However, part-time work is less common among natural and applied science policy researchers, consultants and program officers (12%). The all-occupation rate for part-time employment in B.C. is 26%.

Unemployment among the entire group is lower than the all-occupation average. However, for those workers in other professional occupations in social science it is higher (11%) than the B.C. occupational average (7%) and slightly above average among recreation and sports program supervisors and consultants (8%).

Many in the entire group are employed full time for only part of the year. This situation is more prevalent among other professional occupations in social science (39%), and those occupied in the natural and applied sciences (35%), but it is less common among economists and economic policy researchers and analysts (18%) and program officers unique to government (21%). Across all occupations in B.C., 27% of the workforce work full time for part of the year.

These workers are employed in a very wide range of industries with no specific industry able to claim a significant proportion of this group's workers. About 16% of the group work in education, 12% are with various health and social services, another 11% are found in business services, 9% are with provincial government, and 7% work in local government and administration.

In view of the fact that these workers concentrate in administrative centres for education and health and social services, it is not surprising that the proportion of this group located on Victoria (16%) is higher than the all-occupation average representation for that area (9%). About 61% are located in the Lower Mainland, while the Okanagan/Kootenay with 10% and Northern B.C. with 6% are slightly underrepresented for their population densities.

Women make up a slight majority (57%) of the workers for the entire group, but there is substantial variation in their representation from occupation to occupation. They account for 31% of economists and economic policy researchers and analysts and 33% of the economic development officers and marketing researchers and consultants, but they make up 66% of recreation and sports program supervisors and consultants and 66% of those working in the education sector. Across all occupations in B.C., women make up 46% of the workforce.

There is also substantial variation in the age distribution for the different occupations within this occupational group, but for the group as a whole, the representation of different age groups is fairly similar to the all-occupation average figures. The only exceptions are a lower proportion of workers under the age of 25 and a slightly higher proportion of those aged 45 to 54.

Employment Prospects

Employment for this occupational group in B.C. is projected to grow at an annual rate of 2.3%, or faster than the all-occupation average, according to the Canadian Occupational Projection System (COPS). However, individual outlooks for specific occupations vary significantly. Approximately 5,850 employment openings are projected in B.C. between 1998 and 2008. About 43% or 2,540 of these job openings will be the result of retirements.

Most opportunities with the federal government will be the result of retirements rather than the creation of new jobs. There still will be some opportunities with the provincial and local levels of government, although funding constraints are expected to restrict the number of available positions. The availability of employment will vary among the different occupations within this group. Most employment openings will occur in business services, such as consulting firms, business and professional associations, research institutes, non-government organizations and the health and social services sector. Industry sources expect more of the work opportunities to be either part time or contractual, with self-employment becoming more prevalent. (Self-employment more than doubled between 1990 and 1995 to 17% of this occupational group.)

Employment growth for *economists* and *economic policy researchers* and *analysts* and for *program officers unique to government* is expected to be slower than the all-occupation average.

For *health* and *social policy researchers, consultants* and *program officers*, employment growth is expected to be about as fast as the all-occupation average.

Employment growth is expected to be faster than average for *researchers, consultants* and *program officers* in *natural* and *applied science policy, education* and *other professional occupations in social science*.

Employment growth is expected to be much faster than average for *economic development officers, researchers* and *consultants* as well as for *recreation sports program supervisors* and *consultants*.

Demand for *marketing researchers* should be strong due to an increasingly competitive economy. As companies seek to expand their markets and consumers become better informed, the need for marketing researchers will increase. Opportunities for marketing researchers with graduate degrees should be good in a wide range of employment settings, particularly in marketing research firms. This trend will continue as companies find it more profitable to contract out for marketing research services rather than to support their own marketing departments.

Other organizations, such as financial services organizations, advertising firms, manufacturing firms producing consumer goods and insurance companies, may offer opportunities for these workers as more companies seek professional assistance as changes in information technologies rapidly progress. Most often the positions will be contractual or part time.

Individuals entering marketing research generally gain required experience working within the marketing department of a large firm or as an employee of a marketing company. They usually also obtain basic skills by performing entry-level work within a department, or by performing market research. These skills can often be obtained through volunteer work in the field, a cooperative education placement or an internship program.

Faster than average growth is expected for other professional occupations in social sciences (for example, *sociologists, anthropologists, geographers*, and *political scientists*). Employment prospects are best for those workers with advanced degrees and usually are better in disciplines such as sociology and geography, which offer more opportunities in nonacademic settings. These workers will face intense competition for academic opportunities. However, the growing importance and popularity of social science subjects in secondary schools is strengthening the demand for social science teachers at that educational level. These workers often find work opportunities outside traditional social science areas, often in related work that requires good research, communication and quantitative skills. There is a solid demand for those who can quickly and efficiently gain access to data, interpret it and present this information in concise and understandable terms in private companies and government agencies, which rely on information and insight into global economic and social trends.

In spite of the growth and the large replacement needs in this occupational group, some industry sources indicate that there is a surplus of persons who would like to work in this field. In general, those persons who have experience in their fields are most in demand. Industry sources warn that these workers are very vulnerable to cutbacks in funding for research in both the private and public sectors. They advise that anyone planning to work in these fields should acquire additional abilities, such as strong computer and writing skills, to ensure that they can be re-employed in other positions that incorporate their specialized knowledge.

It should be noted that some of the occupations that are expected to experience fast growth are small groups in which there will be relatively small numbers of openings, even at rates of growth that are higher than average. For example, the number of workers in other professional occupations in social sciences in B.C. stood at only 370 in the year 1998. At an annual growth rate that is faster than the average, there would only be 80 new positions in the province to the year 2008.

If British Columbia continues to be a popular place in which to settle for those from other provinces and overseas, competition for employment in these occupations will remain intense, despite their relatively good growth prospects.

Related Occupations

natural and applied science policy researchers, consultants and program officers (4161):

- architecture and science managers (in 01/09 middle and other management)
- physical science professionals (211)
- biologists and related scientists (2121)
- forestry professionals (2122)
- professional occupations in engineering (in 213 professional occupations in civil, mechanical, electrical and chemical engineering, and in 214 other professional occupations in engineering)

economists and economic policy researchers and analysts (4162):

- financial and investment analysts (1112)
- government managers in economic analysis, policy development and program administration (in 01/09 middle and other management)
- economists who teach at universities (in 4121 university professors)

economic development officers and marketing researchers and consultants (4163):

- financial and investment analysts (1112)
- other financial officers (1114)
- urban and land use planners (in 215 architects, urban planners and land surveyors)
- economic development managers (in 01/09 middle and other management)
- marketing managers (in 01/09 middle and other management)

social policy researchers, consultants and program officers (4164):

- program leaders and instructors in recreation and sport (in 525 athletes, coaches, referees and related occupations)
- recreation and sports program and service directors (in 01/09 middle and other management)

health policy researchers, consultants and program officers (4165):

- community and social service workers (4212)
- government managers in health and social policy development and program administration (in 01/09 middle and other management)

- managers in health care (in 01/09 middle and other management)

education policy researchers, consultants and program officers (4166):

- college and other vocational instructors (4131)
- elementary school and kindergarten teachers (in 414 secondary and elementary school teachers and counsellors)
- government managers in education policy development and program administration (in 01/09 middle and other management)
- school and guidance counsellors (in 414 secondary and elementary school teachers and counsellors)
- secondary school teachers (in 414 secondary and elementary school teachers and counsellors)

recreation and sports program supervisors and consultants (4167):

- program leaders and instructors in recreation and sport (in 525 athletes, coaches, referees and related occupations)
- recreation and sports program and service directors (in 01/09 middle and other management)

program officers unique to government (4168):

- administrative officers (1221)
- court officers and justices of the peace (1227)
- immigration, employment insurance and revenue officers (1228)

other professional occupations in social science not elsewhere classified (4169):

- college and other vocational instructors (4131)
- psychologists (4151)
- secondary school teachers (in 414 secondary and elementary school teachers and counsellors)
- university professors (4121)

Skill Level B - Technical, Paraprofessional and Skilled Occupations

Paralegal and Related Occupations

NOC 4211

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	2,280	4,260	4,530

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
270	1,680	1,950

Annual Growth 1998-2008 0.6%

Main Industries of Employment

Professional Business Services	73%
Metal Mining	8%
Other Business Services	4%

Employment by Region

Lower Mainland	72%
Vancouver Island	14%
Northern B.C.	3%
Okanagan/Kootenay	11%

Self-employment 11%

Nature of the Work

Legal assistants and *paralegals* in law firms assist lawyers by preparing legal documents, maintaining records and files and conducting research. *Notaries public* prepare promissory notes, wills, mortgages and other legal documents. Trade mark agents research and prepare trade mark applications.

Legal assistants, paralegals, notaries public and trade mark agents are employed by law firms and in legal departments throughout the public and private sectors. Trade mark agents are also employed by trade mark development and searching firms, or they may be self-employed. Independent paralegals provide certain legal services to the public, as allowed by provincial legislation, and are usually self-employed.

Main Duties

Legal assistants and *paralegals* in law firms assist lawyers by interviewing clients, witnesses and other related parties. They prepare legal documents and affidavits and do legal research on records, court files and other legal documents.

Notaries public draft contracts, prepare promissory notes and draw up wills, mortgages and other legal documents. They administer oaths, take affidavits and depositions and witness and certify the validity of signatures on documents. They also arrange probates and administer the estates of deceased persons.

Trade mark agents search trade mark registries to determine whether a trade mark has been registered. They prepare and present applications for trade mark registration and advise their clients on trade mark laws and regulations.

Independent paralegals represent clients in small claims court and in other lower court proceedings. They advise their clients and take legal action on landlord and tenant matters, traffic violations, name changes and other issues within their jurisdictions.

Example Titles

- commercial law clerk
- family law paralegal
- real estate law clerk
- litigation legal assistant
- legal researcher
- corporate paralegal
- law clerk
- trade mark agent
- title searcher
- independent paralegal
- legal assistant
- paralegal
- notary public

Education and Training

Although post secondary education is not required in order to work as a *legal assistant* in British Columbia, programs are available for those who wish to have a broader knowledge base than that which is provided by in-house training programs. These programs are designed to prepare individuals to function as legal assistants under the direction of lawyers in the private and public sector.

Capilano College offers two programs. The Legal Assistant Diploma Program is a two-year, full-time course of study designed for people without current legal experience. Upon completion of the program, students undertake a six-month paid practicum under the supervision of a lawyer. At the end of a successful practicum, students are eligible for graduation. Admission requires an interest in law, completion of two years of university transfer courses, emotional maturity, work experience, computer knowledge and keyboard skills. The Legal Assistant Certificate Program is a part-time evening program designed for people who are presently working in a law office and who have at least two years' legal secretarial or paralegal experience. The program takes three to five years to complete.

Selkirk College also offers a certificate program for legal assistants. Admission to this 11-month program requires grade 12 with English 12 or equivalent, completion of at least one year of business, office administration or university transfer courses, five years of office experience, advanced word processing skills and a minimum of 45 wpm keyboard skills.

Individuals who are enrolled in or who have completed legal assistant programs are eligible for membership in the B.C. Association of Legal Assistants, whose mandate includes promotion of the profession and provision of educational seminars and presentations. As well, the Association provides opportunities for social and professional interactions.

In order to work as a *notary public* in B.C., individuals must complete a two-year program offered by the Society of Notaries Public of B.C. in Vancouver, pass a statutory examination, complete an articling period and become a member of the Society. Graduates from recognized secondary school academic programs are eligible to apply, although a college diploma, university degree or recognized professional designation is preferred. Applicants should have business or employment experience of two years, or five years if applying without post secondary education. A background in areas such as conveyancing, legal drafting or banking is beneficial. Applicants must be Canadian citizens or permanent residents of Canada and must not have a criminal record. Personal details are verified before acceptance, and the screening process can take up to a year.

The products of this type of employment are written and, to a lesser extent, spoken words. Therefore persons in this field must have highly developed language skills. They must be able to write coherently without spelling or grammatical errors and be able to express themselves with verbal clarity. They must be able to comprehend and follow instructions and, once given instructions, be able to act with self-direction, assertiveness and eagerness to engage in problem-solving.

They should enjoy detail-oriented work, be able to concentrate on tasks for long periods of time and be able to meet deadlines. A willingness to work overtime and weekends may be necessary at times. Since much of the work concerns private affairs of clients, these workers must be honest and trustworthy and have a sense of responsibility and respect for the confidentiality of the information to which they have access.

Working Conditions

Paralegals and *related workers* usually carry out most of their duties in offices or law libraries. In order to gather information or perform other duties, they must sometimes travel outside their usual workplace. Although their standard work week is generally scheduled for 40 or so hours, they must occasionally work very long hours under pressure to meet deadlines, which some employers reward with bonuses or additional time off.

These workers perform many routine tasks. Their responsibilities and the variety and challenge of their assignments may increase with greater experience and with displays of initiative and individual excellence.

The 1995 average annual earnings for paralegals and related workers were $29,600, slightly more than the average of $27,900 for all occupations. Full-time, full-year paralegals earned $35,700, compared to the all-occupation average of $39,400. Most of the workers in these occupations are women, who earn substantially less for full-time, full-year work than their male counterparts ($34,500 and $43,900 respectively). A recent graduate survey found that college graduates who found entry-level positions in this field earned on average $2,590 per month for full-time work. Industry sources suggest that entry-level workers can expect to earn $25,000 per year, and experienced workers may earn as much as $50,000 per year, depending on the employer, personal initiative and experience and productivity.

Paralegals and related workers form a medium-sized occupational group. In 1990 there were 2,280 such employees in

British Columbia. By 1998 the number is estimated to have risen to 4,260, an 87% increase.

Only 11% of this occupational group is self-employed, lower than the share of self-employment for all of B.C. (15%). As in most professional fields, paralegals have a lower than average unemployment rate and experience little impact from seasonal fluctuations in their work.

The majority (73%) of all paralegals work in professional business services, mainly law firms. The remaining workers are scattered throughout various service and business sectors, such as metal mining and the provincial government. Almost three-quarters of all paralegals work in the Lower Mainland. About one in every seven is employed on Vancouver Island, but this profession is underrepresented throughout the Okanagan/Kootenay and especially in Northern B.C.

As mentioned, this occupational group is dominated by women who account for 85% of all paralegals. Paralegals have an average age of 39, almost identical to the all-occupation average of 38 years. This would explain why paralegals tend to be more concentrated in the age group 25 to 44 years, with relatively fewer younger and older workers.

Employment Prospects

The Canadian Occupational Projection System (COPS) forecasts an annual growth rate between 1998 and 2008 of 0.6% for *legal assistants* and *paralegals*, which is slower than the all-occupation average. Approximately 1,950 positions will become available in British Columbia over this period of time. Of these positions, 86% or 1,680 will be due to openings from retirements. However, industry sources expect an annual growth rate between 1.4% and 1.8%.

New technology in the office and government cutbacks to legal aid are among the major factors that may decrease employment growth for paralegals. This may be offset to some extent if the work of paralegals is substituted for the more expensive work of lawyers (NOC 4112). Law firms and other businesses may lower costs and increase the availability and efficiency of legal services by hiring these workers.

Office automation has had an impact on numerous clerical positions in recent years. Paralegals are highly skilled people who, until recently, have escaped the efficiency impacts of widening computer usage. Now more computerized record and deed files and computerized legal research databases may negatively affect this occupational group's employment prospects in the future. The potential exists for research to be swifter, increasing the productivity of workers and permitting fewer workers to accomplish the same volume of work. However, the scope for lower-cost research is also increased. The result may be more demand for paralegal workers to undertake research using the new technology.

The range of employment opportunities for paralegals has expanded considerably. The business sector, rather than court registry and clerks' offices of the provincial government, is now the main area of opportunity, employing 73% of all workers. Within the business sector, private law firms will continue to be large employers of paralegals, but a growing array of other organizations, such as corporate legal departments, insurance companies, real estate and title insurance firms and banks, also hire paralegals. These organizations are expected to grow as an increasing population requires additional legal services, especially in such areas as intellectual property, health care, international, elder, sexual harassment and environmental law. These workers are increasingly employed in small and medium-sized establishments.

Although only firms with a certain volume of legal business can afford to set up an internal legal department, a growing number of small and medium-sized businesses prefer to hire their own legal advisors to reduce the cost of professional legal fees. This is fuelling the demand for paralegals.

Paralegals are expanding the range of their duties as their role in the legal system changes. Independent paralegals (self-employed paralegals) can provide certain legal services as allowed by provincial legislation. For example, a person accused of a crime has a choice of agents to represent him or her. Independent paralegals may fill this role by representing the accused in small claims court and in some other lower court proceedings.

To a limited extent, paralegal jobs are affected by the business cycle. During recessions, demand declines for some nonessential legal services, such as planning estates, drafting wills and handling real estate transactions. Corporations are less inclined to initiate litigation when falling sales and profits lead to more conservative budgets. In offices adversely affected by recessions, full-time paralegals may be laid off or have their work hours reduced. On the other hand, during recessions corporations and individuals are more likely to face other problems that require legal assistance, such as bankruptcies, foreclosures and divorces. Since paralegals provide many of the same legal services as lawyers (NOC 4112) and at a lower cost, they tend to fare relatively better than lawyers in difficult economic conditions.

As paralegals gain work experience, they are usually given more responsibilities and less supervision. Experienced workers may supervise and delegate assignments to other workers and clerical staff. A career progression may include promotion to managerial and other law-related positions within the firm. Some paralegals find it easier to move to other firms when seeking promotions.

Important assets for paralegals are verbal and written communication skills and abilities in word processing. A knowledge of accounting is also highly sought after by many employers.

Related Occupations

- legal secretaries (included in 124, secretaries, recorders and transcriptionists)
- articling law students and trade mark lawyers (in 4112, lawyers)

- patent agents (included in 416, policy and program officers, researchers and consultants)

Community and Social Service Workers

NOC 4212

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	5,930	9,480	11,350

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
1,870	4,020	5,890

Annual Growth 1998-2008	1.8%

Main Industries of Employment

Other Health and Social Services	73%
Provincial and Territorial Administration	11%
Other Service Industries	5%

Employment by Region

Lower Mainland	53%
Vancouver Island	20%
Northern B.C.	10%
Okanagan/Kootenay	16%

Self-employment	4%

Nature of the Work

Community and *social service workers* administer and implement a variety of social assistance programs and community services. They assist clients to deal with personal and social problems. They are employed by social service and government agencies, group homes, correctional facilities and other establishments.

Main Duties

Community and *social service workers* interview clients to obtain their case histories and other background information. They prepare intake reports, assess their clients and investigate their eligibility for social benefits. If necessary, they will refer their clients to other social services. Later they meet again with their clients to assess their progress, give them support and discuss any difficulties or problems.

The community and social service workers advise and aid recipients of social assistance and pensions. They counsel and provide assistance to clients living in group homes and half-way houses and supervise their activities. They also provide crisis intervention and emergency shelter services.

These workers implement life skills workshops, substance abuse treatment programs, youth services programs and other community and social service programs. This work is done under the supervision of social workers or health care professionals. They also can assist in evaluating the effectiveness of these treatment programs by tracking clients' behavioural changes and responses to interventions. Community and social service workers maintain contact with other social service agencies involved with their clients to provide information and to obtain feedback on clients' overall progress.

Example Titles

- women's centre coordinator
- addictions worker
- community service worker
- crisis intervention worker
- group home worker
- income maintenance officer
- mental health worker
- native outreach worker
- financial assistance worker
- drop-in centre worker
- welfare and compensation officer
- community development worker
- life skills instructor
- family service worker
- developmental service worker
- rehabilitation worker
- veterans service officer
- youth worker

Education and Training

Employment in this field usually requires completion of at least a one- or two-year relevant college program. Graduation from a human/social service worker program may prepare graduates for paraprofessional positions, such as *financial aid workers*. Competition for these positions is increasing, and a Bachelor of Social Work (BSW) is becoming a more common requirement. Those who want to work as *child* and *youth care workers* must have a child and youth care diploma or bachelor's degree or an equivalent combination of education and experience.

Human/social service worker certificate programs are offered by most colleges, the Open Learning Agency and all five University Colleges in B.C. These full-time programs generally take 10 months to complete. Applicants usually have grade 12 or equivalent, good physical and emotional health, experience as a volunteer or employee in a relevant field and references. College of New Caledonia also offers a Child Care and Family Support diploma for those who have completed the College's Social Services certificate. This diploma program is designed to enhance skills and ability to work independently. For a review of BSW programs, see the profile Social Workers (4152).

Certificate and diploma programs in child and youth care are available at Douglas College, Selkirk College, Vancouver Community College, Malaspina University College, University College of the Fraser Valley and the Justice Institute of B.C. Degree programs are offered at Malaspina University College, University College of the Fraser Valley and the University of Victoria.

Other programs that may be relevant include community support worker and corrections worker programs available at B.C. colleges. Admission to these programs generally requires completion of grade 12 or equivalent. Registrants can obtain a one-year certificate or a two-year diploma. Graduates who want to go on to pursue a bachelor's degree in social work may receive partial credits at B.C. universities and university colleges.

Experience working with people, including as a volunteer, is a definite asset when seeking employment in this field. *Community* and *social service workers* should be mature and emotionally stable and have a genuine concern for the well-being of others. They must be creative, reliable and able to supervise and lead. Excellent verbal and written communication skills are required as well as decision-making ability and problem-solving skills. Familiarity with the developmental, educational, emotional, social and recreational needs of people is an asset.

Working Conditions

The working environment for *community* and *social service workers* may vary. Many spend part of their time in an office or in a group residential facility, while the rest of their time may be spent in the field visiting clients, taking them on trips or meeting with people who provide other services to clients. Most will work a standard 40-hour week, but some of those hours may be in the evening or on the weekend. Workers in this occupational group who are employed in residential settings generally work in shifts because residents need supervision around the clock.

This work can be emotionally draining, and understaffing and lack of equipment may add to the pressure. Turnover is reported to be high, especially among workers who lack academic preparation for these occupations. However, many who have undergone more extensive training for this field indicate that they find their work to be very satisfying.

The earnings of community and social service workers are below the all-occupation average. In 1995 their average annual earnings were only $21,700. This level was $6,200 below the average annual earnings for workers across all occupations. Even full-time, full-year community and social service workers earned only $29,800, below the economy-wide average of $39,400 for full-time, full-year employment. These lower than average incomes may be partly explained by the high percentage of workers who experience less than full-time employment. A recent graduate survey found that new workers in this field earned on average $1,920 per month. Based on a reported average of 32 hours per week, these entry-level workers are earning approximately $15 an hour. In addition, those employed in union environments and with academic training in these occupations will earn substantially more than those employed in non-union situations.

While this occupational group is dominated by women, men in this group earn slightly more than women. However, their wages are more than 46% less than those of men across all occupations, while women community and social service workers are earning the same as women across the entire economy.

This is a large occupational group that has grown rapidly for several years. There were an estimated 9,480 employees in this field in 1998, an increase of 60% from 5,930 in 1990. Total employment in all occupations in B.C. grew much more moderately by comparison. However, the forecast for future growth in this field is much more modest.

Only 4% of community and social service workers are self-employed, well below the average of 15% across all occupations. Part-time work is somewhat more common in this field, with 28% of workers employed part time, compared to 26% in the province overall. The unemployment rate for these workers is just below the B.C. all-occupation average.

While not a seasonal occupation in the traditional sense, there is a large proportion of part-year employment in these occupations. Approximately 25% of community and social service workers in 1995 worked only part of the year, very close to the 27% average across the entire work force.

More than 70% of community and social service workers are employed in health and social services, such as homes for the disabled, treatment centres, health clinics and various health and welfare agencies. A much smaller share are found in the provincial government. A variety of service industries and local government employ most of the remainder.

Community and social service workers are spread across B.C. in nearly the same proportions as the overall workforce. There are somewhat fewer of these workers in the Lower Mainland, 53% compared to 57% for all occupations.

While 46% of all workers in the province are women, they make up 74% of community and social service workers.

The average age of community and social service workers is 37 years, compared to 38 years for all occupations. Compared to the average for all occupations, these workers are distributed in comparable numbers across all age groups, with only a slightly higher percentage in the 25 to 34 age group.

Employment Prospects

Employment for *community* and *social service workers* in B.C. should grow at an annual rate of 1.8%, or about as fast as the all-occupation average, according to the Canadian Occupational Projection System (COPS). Approximately 5,890 employment openings are projected in B.C. between 1998 and 2008. This occupational group has an average age below the all-occupation average. However, 29% of all community and social service workers are over 45 years. Projections, therefore, indicate that 4,020 of the 5,890 job openings will be the result of workers retiring. Currently industry sources report that there is a surplus of workers who have an insufficient level of qualifications. Therefore, employment opportunities are much better for those workers with appropriate post secondary education.

While most community and social service workers are not government employees, they do work for non-profit agencies. These agencies rely on public funding. For this reason, continued restraint of government funding will act to limit the growth in positions for these workers. Still, these contract agencies will continue to be used as a low-cost alternative to providing services by government workers. In addition to funding restraints, office automation will increase productivity in purely administrative elements of the job and thereby reduce employment demands for any given level of service.

Industry sources suggest that opportunities will be best in job training programs, residential care facilities and private social service agencies. The growing population of elderly persons, the mentally disabled and developmentally challenged, pregnant teenagers, homeless persons and those with substance abuse problems will continue the need for these workers. Other areas where growth is expected are in native outreach and community development, especially for youth, as well as in rehabilitation.

Experienced workers may advance to supervisory positions. With additional education, training and experience, community and social service workers may progress to professional social services positions, such as social workers (NOC 4152), as well as positions within family, marriage and other related counsellors(NOC 4153), or probation and parole officers and related occupations(NOC 4155).

Related Occupations

- employment counsellors (4213)
- family, marriage and other related counsellors (4153)
- managers in social, community and correctional services (included in 01/09, middle and other managers)
- probation and parole officers and related occupations (4155)
- program leaders and instructors in recreation and sport (included in 525, athletes, coaches, referees and related occupations)
- school and guidance counsellors (included in 414, secondary and elementary school teachers and counsellors)
- social workers (4152)

Industry sources suggest that opportunities will be best in job training programs, residential care facilities and private social service agencies.

Employment Counsellors

NOC 4213

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	1,030	1,660	1,990

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
330	710	1,040

Annual Growth 1998-2008 1.8%

Main Industries of Employment

Other Health and Social Services	26%
Federal Administration	18%
Other Business Services	18%

Employment by Region

Lower Mainland	58%
Vancouver Island	19%
Northern B.C.	6%
Okanagan/Kootenay	17%

Self-employment 8%

Nature of the Work

Employment counsellors provide assistance, counselling services and information to workers on all aspects of job search and career planning. They also provide counselling and information to employers regarding human resource and employment issues.

Employment counsellors are employed primarily by federal and provincial governments but are also employed by large establishments and private employment service agencies. Supervisors of employment counsellors are included in this occupational group.

Main Duties

Employment counsellors interview workers to obtain their employment history, educational background, and career goals. They identify barriers to employment and assist clients to develop job readiness skills and job search strategies. They administer and interpret tests designed to determine the interests, aptitudes and abilities of their clients. The counsellors then assess the need for assistance, such as rehabilitation, financial aid or further vocational training, and refer their clients to the appropriate services.

Employment counsellors advise employers on human resource and other employment-related issues. They also collect labour market information for clients regarding job openings, entry and skill requirements and other occupational information.

Example Titles

- occupational counsellor
- outplacement counsellor
- relocation consultant
- relocation counsellor

- career counsellor
- vocational counsellor
- supervisor, employment counsellors
- employment counsellor

©Stone/Vancouver

Education and Training

Generally, the minimum requirement for a career in *employment counselling* is a four-year undergraduate degree in a social science discipline, such as education, psychology, family studies, sociology, social work or theology. In some settings, completion of a two-year social service diploma plus several years' experience in services related to counselling may be sufficient. Counselling positions in public schools and post secondary institutions usually require a bachelor's degree followed by a master's degree in counselling psychology, psychology or social work. A doctorate in counselling psychology is becoming increasingly important. Specific requirements vary between school districts, but in most school systems counsellors must also be certified teachers.

For more details on providing counselling in the educational system, see the profile Secondary and Elementary School Teachers and Counsellors (414).

All B.C. universities offer undergraduate and graduate programs in social sciences. Most university colleges offer undergraduate degrees in various social science disciplines, or one- or two-year programs that allow transfer to the universities.

The University of British Columbia and the University of Victoria both offer master's and doctoral degrees in counselling psychology. Applicants must have a bachelor's degree and at least three years' paid or volunteer experience in positions that involve working with people. Simon Fraser University also offers a master's degree in counselling psychology, with emphasis on counselling in educational settings. The University of Northern British Columbia has an educational counselling focus in its master's degree program in education.

A collaborative Alberta University graduate program in counselling is offered through Athabasca University. Students will graduate from this program with a Master of Counselling degree. Various concentrations are available within this program, including a specialization in Career Counselling.

For practitioners who have a degree or are already in the field and want to enhance their skills as employment counsellors, Douglas College and University College of the Fraser Valley both offer Employment Counselling Certificate programs designed to provide professional development. The Open University offers a part-time Career and Employment Counselling Certificate program. Capilano College offers a Career Development Facilitator Certificate program. This is a full-time, four-week program. Malaspina University College also offers a Career Practitioner Certificate program that aims to provide professional development opportunities for experienced career practitioners. Admission into any of these programs requires current employment in the field or completion of a relevant undergraduate degree. Applicants to all these programs also need to have excellent communication and computer skills.

Standards and guidelines for career development are being set up for those within the field of employment counselling to ensure that career development is recognized as a distinct area of professional practice. These standards are meant to establish credibility from within the profession, foster acknowledgment from without and provide protection for qualified professionals and for the public.

Employment counsellors must be knowledgeable about employment searches and career planning as well as human resource and employment issues. They should have a good understanding of human behaviour and development, enjoy learning about many kinds of occupations, be able to listen and ask questions effectively and have patience and understanding. They should have a strong desire to help others and should be able to negotiate and mediate. They require an ability to inspire respect, trust and confidence. Good communication and analysis skills, knowledge of computers, adaptability and flexibility are important. A willingness to collaborate with others is also important.

Working Conditions

Employment counsellors generally work a standard 40-hour week. Since privacy is an essential element of confidential discussions with clients, most counsellors work in private offices. Employment counsellors must display tact and understanding while dealing with clients who may be experiencing anxiety or stress.

In 1995 these counsellors earned an average annual total of $28,400. Those counsellors who worked full time, full year earned $36,400. These figures are fairly consistent with the average across all occupations in B.C. However, men who worked as employment counsellors earned about 7% less than the average for men across all occupations. Women counsellors earned 27% more than women generally, and full-time, full-year women counsellors exceeded the average incomes of full-time, full-year women workers in all occupations by 11%.

This is a small occupational group, employing just over 1,660 people in 1998. It has grown from 1,030 since 1990, which is an increase of over 60% in less than a decade.

Self-employment is not common in this field. Only 8% of employment counsellors are self-employed, compared to the all-occupation average of 15%. Part-time employment is less common in this occupational group as well, with 16% working part time compared to 26% across the entire labour market. However, at 21%, part-time work is three times more common among women than among men.

Although this is a professional and public service occupation, it has had an unemployment rate that is close to the average of all occupations. Most of these workers (84%) worked full time for all or part of the year.

Most of the employment in these occupations is spread across five industry groups. The health and social services sector employs just over a quarter of all employment counsellors, while close to one-fifth work for the federal government. Business service firms, education and the provincial government also employ significant proportions of B.C.'s employment counsellors.

The regional shares of employment counsellors are very similar to the regional shares of the entire work force. However, there is a somewhat lower proportion of counsellors in Northern B.C., 6% compared to 10% across all occupations. The Lower Mainland has 58% of all the workers in this group, Vancouver Island has 19%, and the Okanagan/Kootenay has 17%.

Two-thirds of employment counsellors are women, substantially more than the 46% representation for women in the overall work force.

The average age of these counsellors is 40, slightly higher than the average age of 38 for the entire work force. There is a higher than average concentration of employment counsellors in the 45 to 54 year age group, and very few are under the age of 25.

Employment Prospects

Employment growth for *employment counsellors* in B.C. is projected to be 1.8%, or about as fast as the average, according to the Canadian Occupational Projection System (COPS). Approximately 1,040 employment openings are projected in B.C. between 1998 and 2008. Of these openings, 68% or 710 will be the result of workers retiring.

Employment counsellors can expect to have increased demands for their services. Experienced workers seeking a new or second career, laid-off workers seeking training and other services, full-time homemakers seeking to enter or re-enter the work force and workers who want to upgrade their skills may all seek assistance. A factor that will contribute to the requirement for employment counselling is high youth unemployment. Continuing technological change and industrial restructuring will also result in people who are not of retirement age needing assistance. During economic slowdowns, demand typically increases as the number of unemployed persons increases. As a result of the changes in technology, workers are continually seeking to update and upgrade their skills. Higher turnover of the workforce arising from the need to pursue post secondary education will increase the volume of work for employment counsellors.

Despite the apparent need for employment counsellors, continued restraint of government funding is likely to affect who will do the counselling. During the 1990s responsibility for many training programs was transferred from the federal to the provincial government. The provincial government then allocated these programs to non-profit agencies in the health and social services sector, and as a result, the number of employment counsellors employed in the public sector decreased. In the short term, the number of new openings for public sector counsellors is expected to be minimal. Industry sources believe that growth in non-profit organizations will not be significant. The same industry sources also report that currently there may be a surplus of these workers in the Lower Mainland and the Capital Regional District due to the government funding restraint.

As a result of the decline in the public sector employment of these workers, there has been an increase in the number of counsellors who are self-employed or who work for private consulting firms. In 1990, 2.4% of employment counsellors were self-employed. By 1995, 8% were self-employed.

Job growth may be limited by the increasing use of computerized information systems, such as the Internet, that make employment counsellors more productive and permit fewer workers to work with the same volume of clients. The expanding number of Internet job boards could reduce the number of employment counsellors needed to serve the number of laid-off workers. These job boards provide individuals with self-assessment tools that they can complete on their own or with guidance from a career counsellor, as well as listings of employment opportunities.

For employment counsellors with more experience working in government or large private firms there are promotional opportunities to supervisory and administrative positions. They can also move to positions in personnel or training. With additional education, some counsellors move into research, consulting or university and college instruction.

As lifelong learning becomes more common, the distinctions between the work of the employment counsellor and that of the education counsellor (in NOC 414 Secondary and Elementary School Teachers and Counsellors) may become blurred.

Additional Information

Canadian Association of Career Educators and Employers (CACEE) http://www.cacee.com

Related Occupations

- personnel and recruitment officers (1223)

- school and guidance counsellors (included in 414, secondary and elementary school teachers and counsellors)
- vocational rehabilitation counsellors (in 4153 family, marriage and other related counsellors)

Instructors and Teachers of Disabled Persons

NOC 4215

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	680	1,110	1,330

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
220	470	690

Annual Growth 1998-2008	1.8%

Main Industries of Employment

Education	72%
Other Health and Social Services	26%
Other Business Services	1%

Employment by Region

Lower Mainland	57%
Vancouver Island	14%
Northern B.C.	9%
Okanagan/Kootenay	20%

Self-employment	2%

Nature of the Work

Instructors and *teachers of disabled persons* teach physically or mentally disabled children and adults communication techniques, such as braille or sign language. They also teach rehabilitation skills to increase independence and mobility. They are employed in rehabilitation centres and in elementary and secondary schools.

Main Duties

Instructors and *teachers of the disabled* instruct blind or visually impaired students in reading and writing braille and in the use of special equipment. For the deaf or hearing impaired, they teach lip reading, finger spelling and sign language according to individual communication needs. They instruct students who are only hearing impaired in the formation and development of sounds for speech using hearing aids and other devices.

These teachers instruct physically disabled individuals and their families in the use of rehabilitative techniques, prosthetic devices, wheelchairs and other equipment designed to minimize the effects of a disability. They assist physically or mentally disabled individuals to develop life skills.

Example Titles

- instructor, orientation and mobility
- sign language instructor
- teacher of the mentally handicapped
- teacher of the physically disabled
- teacher of the blind
- teacher for the hearing impaired
- teacher of braille
- teacher, rehabilitation
- rehabilitation instructor

Education and Training

A bachelor's degree in education or a related field, such as psychology or social work, is usually required in order to work in this field. Completion of a training program in rehabilitation or special education is generally also required. Instructors of blind people require certification by the Canadian National Institute for the Blind.

To work specifically in the public school system or in a government agency, two qualifications are usually required. These are an undergraduate degree in education or one of the social sciences, with a specialization in working with people who are disabled, and a teaching certificate.

The University of Victoria offers a bachelor's degree in education with a concentration in special education, as well as master's and doctoral degrees in educational psychology with a focus in special education. The University of British Columbia offers special education courses at an undergraduate level as well as master's and doctoral degrees in special education with either a general or a specialized focus. Simon Fraser University offers a bachelor's degree in education with a minor in learning disabilities.

For more information about programs and degrees in education see the profile Secondary and Elementary School Teachers and Counsellors (414).

Undergraduate and graduate programs in psychology and other social sciences are available at most universities and university colleges in British Columbia. As well, most colleges offer up to two years of university transfer courses.

For a review of educational programs in social work see the profile Social Workers (4152).

Vancouver Community College (VCC) offers sign language studies in a part-time evening format, a summer session and a ten-month full-time program. Applicants must have grade 12, manual dexterity, good hand-eye coordination, visual acuity and good hearing. Douglas College offers a two-year diploma in sign language interpretation. Applicants must have proficiency in English, an understanding of the field, either through education or training, and advanced American Sign Language skills (which can be acquired in the VCC program).

Instructors and *teachers of disabled persons* must be able to communicate in a clear, concise and interesting manner. They must be imaginative and resourceful with an ability to motivate students. They need compassion, patience and, at times, persistence. Organizational skills are required as is a willingness to continue learning.

Working Conditions

Most of the workers in this occupational group work a standard 35 to 40 hour week, but some of those hours may be in the evening or on the weekend. Some may work part time.

While much of their schedule is spent in rehabilitation centres or schools, some time may be spent in the field taking students on trips or meeting with people who provide other services to students and other clients.

The work, while satisfying, can be very demanding and exhausting at times. Understaffing, lack of equipment and heavy workloads can add to the pressure in some organizations.

The average annual earnings for *instructors* and *teachers of the disabled* in 1995 were $27,700, and full-time, full-year workers in 1995 earned $36,800. These earnings are very close to the annual averages for the workforce as a whole. Women instructors of the disabled earn incomes that are 27% higher than those of women across the entire work force. Teachers of the disabled who are men earn close to the average for all men across the B.C. economy.

Instructors and teachers of the disabled form a small occupational group, with 680 workers in 1990, but increasing to 1,110 by 1998. While these numbers are small, the growth from 1990 to 1998 was a rapid 63%, a significant increase in less than a decade. However, projections indicate that this growth rate is expected to slow over the next few years.

Barely 2% of the teachers of the disabled are self-employed, far less than the average of 15% for the B.C. labour market. One-third of the instructors of the disabled work part-time, slightly higher than the average of 26% across the entire work force. The rate of unemployment is much lower the average for all occupations. This occupation is not affected by seasonal fluctuations.

Most of these teachers (72%) work in the education sector. The majority of the other workers in this occupational group (26%) are found in health and service industries, such as homes for the disabled and helping agencies.

Unlike many other health and education fields, this occupation is somewhat better represented in the Okanagan-Kootenay and slightly underrepresented on Vancouver Island. The remaining workers are distributed evenly by population density throughout the Lower Mainland (57%) and Northern B.C. (9%).

Not many occupational groups have a larger concentration of women workers than instructors of the disabled, 81% of whom are women.

The average age of these teachers (41) is slightly higher than the overall work force (38). These workers are more concentrated in the 35 to 54 age groups, and there are almost none under the age of 25 working in this occupational group.

Employment Prospects

Employment for *instructors* and *teachers of disabled persons* in B.C. is projected to grow at an annual rate of 1.8%, or about as fast as the all-occupation average, according to the Canadian Occupational Projection System (COPS). Approximately 690 employment openings are projected in B.C. between 1998 and 2008. More than two-thirds of the openings will be the result of workers retiring. The projected growth rate reflects the expectation for average job growth in the education sector. Fewer new jobs are expected in health and social services and in provincial administration.

For educators of all types, government spending restraint will dampen growth in employment from 1998 to 2008, but the impact may be less than for other social services workers. "Mainstreaming" of pupils with such disabilities as physical dependence, visual impairment, hearing impairment, severe behaviour disorders or learning disabilities has incorporated much of this instruction into the regular "K to 12" educational system. As a result, job growth for these workers will be limited. However, the ever-increasing recognition of disabilities and their remedies and the demands from persons with disabilities for full access to employment and society are all acting to oppose this trend.

There is an increasing need for these workers as the number of children identified as requiring special education continues to grow. Advances in medicine result in more survivors of accidents and illnesses, and the postponement of childbirth by more women results in a greater number of premature births and birth defects. The growth in the general population is also leading to the increase. In 1990 the Ministry of Education reported that there were 28,704 students with special needs. Their numbers grew through to 1998 resulting in 48,902 such students, an increase of 70%. To place these numbers in context, the number of teachers increased by only 14% between 1990 and 1998, and the overall number of students increased by 18%. Since many students who have special needs are not identified or recognized for funding purposes, and therefore are not receiving the special services they require, the 70% increase estimate may be an understatement.

According to industry sources, there is currently a shortage of teachers required to provide services to students with special needs. Post secondary institutions responsible for the preparation of these specialized teachers are experiencing a decrease in the number of students entering these programs. In addition, there is currently a significant shortage throughout B.C. of special education teachers for the hearing and vision impaired.

To address these shortages, a recent study recommends a variety of measures to increase the number of such teachers. These measures include providing tuition rebates to teachers who undertake advanced study in special education in areas of significant shortage, such as visual impairment, and the development of distance education courses. Distance education would allow teachers working in remote regions of B.C. to undertake special education courses in their communities.

The high stress levels encountered in this occupation often lead teachers to switch to general education or to change careers altogether. As a result of this turnover, additional job openings will become available.

The very personalized nature of most teaching for disabled persons tends to reduce the impact of any technological teaching aides on employment. However, technology is playing an increasingly important role in the education of those with special needs. Special education teachers use equipment such as computers, synthesized speech and voice recognition systems, interactive educational software programs, audio tapes and scanners. These teaching aides enhance teachers' effectiveness and make it easier for disabled students to learn. Those teachers with up-to-date technology skills and an ability to adapt to rapid changes in technology will usually have the best success in finding employment.

Special education teachers can advance to supervisory or administrative positions. They may also earn advanced degrees to become instructors at universities and colleges to prepare others for special education teaching.

Additional Information

B.C. Teachers' Federation http://www.bctf.bc.ca

Ministry of Education http://www.gov.bc.ca/bced/
http://www.bced.gov.bc.ca/specialed

Related Occupations

- early childhood educators and assistants (6470)
- elementary school and kindergarten teachers (included in 414, secondary and elementary school teachers and counsellors)
- elementary and secondary school teacher assistants (6472)
- secondary school teachers (included in 414, secondary and elementary school teachers and counsellors)

According to industry sources, there is currently a shortage of teachers required to provide services to students with special needs. Post secondary institutions responsible for the preparation of these specialized teachers are experiencing a decrease in the number of students entering these programs. In addition, there is currently a significant shortage throughout B.C. of special education teachers for the hearing and vision impaired.

© Stone/Vancouver

5 - OCCUPATIONS IN ART, CULTURE, RECREATION AND SPORT

Skill Level A - Professional Occupations

511 Librarians, Archivists, Conservators and Curators 300
512 Writing, Translating and Public Relations Professionals 304
513 Creative and Performing Artists 311

Skill Level B - Technical, Paraprofessional and Skilled Occupations

521 Technical Occupations in Libraries, Archives, Museums and Galleries 319
522 Photographers, Graphic Arts Technicians and Technical Occupations in Motion Pictures, Broadcasting and the Performing Arts 321
523 Announcers and Other Performers 328
524 Creative Designers and Craftspersons 330
525 Athletes, Coaches, Referees and Related Occupations 336

Librarians, Archivists, Conservators and Curators

NOC 511

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	2,030	1,590	1,820

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
230	840	1,070

Annual Growth 1998-2008	1.4%

Main Industries of Employment

Education	68%
Other Health and Social Services	8%
Other Service Industries	6%

Employment by Region

Lower Mainland	62%
Vancouver Island	19%
Northern B.C.	8%
Okanagan/Kootenay	11%

Self-employment	3%

Nature of the Work

Librarians plan, develop, organize and maintain library collections and provide programs, instructions and advisory services for users. They are employed in libraries or as research or information officers for organizations and businesses. They may also be self-employed consultants.

Archivists acquire, research and store historical documents, photographs, maps, audio-visual material and other archival materials. Archivists are employed in archives and libraries, by government departments and agencies and by private sector organizations.

Conservators restore and conserve museum and gallery artifacts. *Curators* research and recommend the acquisition of museum and gallery artifacts. Conservators and curators are employed in museums and art galleries. Conservators may be self-employed.

Main Duties

Librarians recommend the acquisition of books, periodicals, audio-visual and other materials for inclusion in a library collection. They classify and catalogue library materials, and they prepare bibliographies, indexes, reading lists, guides and other search aids. They develop systems to access library collections, perform manual and online reference searches, make interlibrary loans and perform other functions to assist users in accessing information and library materials.

They also prepare research reports, plan physical facilities and preservation programs for library collections, carry out public relations activities and create databases of organization and retrieval of information. In addition, they provide specialized programs, such as storytime reading for children. They conduct library information and orientation training sessions, and they supervise library technicians, assistants and clerks.

Archivists appraise and acquire archival materials to develop and maintain archival collections. They authenticate historical documents and records, and they research the origins and historical significance of archival materials. They ensure preservation and appropriate storage of historical documents, photographs, maps, audio-visual material, manuscripts, public and corporate records and other archival materials. They also organize archival records and develop classification systems to allow access to archival materials, assist users in accessing archival materials and perform manual and automated reference searches for users.

Conservators restore and conserve paintings, photographs, sculptures, furniture, pottery and other museum and art gallery artifacts. They examine artifacts using various scientific techniques and other means to determine the most appropriate method of restoring them. They provide advice on display and storage of museum and gallery artifacts to ensure proper maintenance and preservation, and they provide consultation to museums, art galleries or private individuals. They also monitor the environment of the whole building as well as supervise conservation technicians and other museum technicians.

Curators recommend the acquisition of paintings, photographs, sculptures, documents and other museum and art gallery artifacts. They research the origins and history of artifacts, develop a storyline and theme for displays and exhibitions, coordinate the storage of collections and setting up of displays and exhibitions, and supervise curatorial assistants and other museum technicians.

Example Titles

librarians (5111):

- supervisor, library
- library consultant
- bibliographer
- cataloguer
- information specialist

conservators and curators (5112):

- assistant curator

archivists (5113):

- chief archivist

Education and Training

Completion of a master's degree in Library and Information Studies (MLIS) is usually needed in order to obtain work as a *librarian*. The only program found in B.C. is offered by the School of Library, Archival and Information Studies at the University of British Columbia (UBC). This is a two-year, full-time program but may be taken on a part-time basis. Applicants are advised to have reading knowledge of at least one language other than English. Basic courses in statistics and computer science are highly recommended. Students are expected to have some skills in using a computer keyboard and knowledge of MS-DOS or UNIX before entering the program. Familiarity with either Windows or another graphic-operating system is increasingly required.

Librarians in the public school system require teacher certification with the B.C. College of Teachers. Courses in school librarianship are available through the faculties of Education at UBC and the University of Victoria (UVic). Public school librarians are not included in this profile, but are included under profile 414 Elementary and Secondary School Teachers and Counsellors.

Archivists usually require a master's degree in history, archival studies or library science. A broad cultural background is expected of the working archivist, so prospective students should study the humanities, social sciences and natural sciences during undergraduate studies, including courses that take a historical perspective and include Canadian history.

UBC's School of Library, Archival and Information Studies offers a master's degree in Archival Studies (MAS). Other postgraduate programs include UVic's Advanced Studies in Cultural Resource Management, which serves those who are currently employed professionally in museums, art galleries, historic sites, building conservation, performing arts and related settings, and Simon Fraser University's post-baccalaureate diploma in Public History. Both programs require completion of a bachelor's degree prior to admission.

Conservators usually hold a master's degree in art conservation. The only graduate program in art conservation in Canada is offered at Queen's University in Ontario. Conservators may find relevant courses within the programs taken by archivists. Fourth-year courses in conservation of organic and inorganic materials are offered by UBC's Department of Anthropology through a hands-on approach at the Museum of Anthropology.

Most *curators* have a doctoral degree in their specific field, for example, a PhD in Botany. Those with lesser degrees or diplomas may find work as assistants or with smaller collections.

The University Museum of Anthropology at UBC offers courses in museum principles and methods to undergraduate and graduate students.

The University of Victoria offers a diploma in Cultural Conservation to those with a relevant undergraduate degree. The program is offered through the Faculty of Fine Arts and normally takes two to three years of part-time study to complete.

Extensive knowledge of computers and other electronic equipment used to maintain databases and records is generally needed in this field. A willingness to keep up-to-date regarding new technologies and information sources is important. Public administration, management skills and instruction skills are definite assets. Excellent reading, research and organizational skills, as well as intellectual curiosity, are required in order to be successful. An ability to work with people of all ages is an asset, as is fluency in more than one language. A commitment to life-long learning and active pursuit of learning opportunities are integral parts of these professions.

For those interested in clerical, technical and paraprofessional duties in libraries, see the profile Technical Occupations in Libraries, Archives, Museums and Galleries (521).

Working Conditions

Working conditions vary for different occupations within this occupational group.

Conditions for *librarians* differ depending on whether they work in a library's user services or in its technical services. Providing instruction or assistance in information gathering involves direct interaction with library users. The difficulty of this activity depends not only on the librarian's skills but also on the user's abilities as well as the number and expectations of other library users waiting for assistance.

Librarians can have their tolerance, patience and tact tested when stationed in user services. When dealing with users who need further assistance after initial instruction, librarians may need to have these users wait while they handle the enquiries of other clients who are also waiting for help.

Librarians working in technical services spend much of their day working at a desk or in front of a computer terminal, so eyestrain or backache can be potential difficulties.

The working conditions for *archivists, conservators* and *curators* also vary. Some work mostly with the public providing reference assistance and educational services. Others conduct research or process records, which often means working alone or in offices with only one or two other people. Those who install or restore exhibits or work with heavy records may have to do a lot of lifting, climbing or stretching. Those who work in zoos, botanical gardens, outdoor museums or historical sites often walk long distances. Curators may need to organize exhibits, conduct research or travel extensively to evaluate potential additions to their employer's collection.

In 1995 the average annual earnings for all workers in this occupational group in B.C. were $31,200, with those who worked full time for the full year receiving an average of $43,100 in earnings. The respective all-occupation averages were $27,900 and $39,400. The average earnings for full-time, full-year librarians were highest ($44,100) in this occupational grouping. The average earnings for full-time, full-year archivists were $42,000, and the earnings of conservators and curators who worked full time for the full year were the lowest at $38,000.

The number of employed workers in this group dropped from 2,030 in 1990 to 1,590 in 1998. Librarians make up the majority of this occupational group (82%). Self-employment for the entire group (3%) is well below the all-occupation average of 15%, but it is much higher among conservators and curators (28%).

Roughly one-third of the group work part-time which is a higher rate than the all-occupation average (26%). Unemployment for the whole group is much lower than the all-occupation average. This occupation is not affected by seasonal fluctuations, although employment opportunities may be somewhat affected by funding levels at educational institutes.

Workers in this group are employed in a variety of industries, but most work in education (68%). In addition to education, these workers are also found in the health, government and service sectors. Most workers in this group are located in the Lower Mainland (62%) and on Vancouver Island (19%). The proportion of workers on Vancouver Island is higher for conservators and curators than for the whole group. For archivists virtually all jobs are located in the Lower Mainland and Vancouver Island.

Women account for the majority (78%) of this group, but this is more indicative of librarians. Men account for over one-third of the conservators and curators and nearly half of the archivists. The age distribution of this occupational group is a little older than the all-occupation age distribution, reflecting the requirement of a master's degree to be a librarian, archivist or conservator. The proportion of people aged 35 to 54 in this group is higher than the all-occupation average, while the figures for those under 35 years old are lower. The exception to this trend is archivists, who have a lower than average concentration in the 35 to 44 age group (17%) and an above average proportion in the 45 to 54 age group.

Employment Prospects

Employment for this occupational group is influenced by information technology changes and government funding. Ongoing fiscal pressure on the provincial and municipal governments is the key limiting factor on overall growth for this occupational group. For the largest component in this group, librarians, some positive factors include growth in the number of post secondary library users, growing demands on public libraries and alternative sources of library funding.

This is a small occupational group, with employment estimated at 1,590 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment in this group to grow at an annual rate of 1.4%, about the same as average for all occupations. A total of 1,070 positions are projected to become available from 1998 to 2008. As a result of an aging workforce, particularly in this occupational group, about 80% of these openings are projected to come from retirements. The remainder will come from growth in the number of new positions.

Librarians comprise 82% of this occupational group and are projected to account for 85% of the projected employment openings. Between 1998 and 2008 it is projected that 210 new librarian positions will occur due to growth, and another 700 positions will occur from retirements. Technological change, and the growing use of the Internet in particular, may increase the demand for delivery of centralized library services and force smaller libraries to restructure their operations. Some industry sources suggest that there is a strengthening in employment demand for librarians compared to the first half of the 1990s as libraries adjust to new and expanding needs for information triggered by changing technologies and the Internet.

Library computerization is evolving rapidly and will have major consequences for librarians. Knowledge of computerized tools has become essential. Computers are more often being used to make document management easier. For example, CD-ROMs are being used to solve serious storage problems in libraries. Library technicians can now handle cataloguing because of the use of computerized systems. Many libraries allow users to access library computers directly from their homes or offices. These systems allow users to bypass librarians and to conduct research on their own. Libraries are starting to offer their users multimedia services, which incorporate sound, image and the written word, and this will require new skills on behalf of both librarians and users.

One of the challenges facing librarians is to make access to the Internet easier for the general public and small business and help to steer their clients toward the appropriate information sources through the multitude of sources available. Since much of the information on the Internet is not well organized, the need to create access protocols, catalogues and indexes is contributing to the changing scope of duties for librarians. They are also sometimes involved in producing content for the Internet.

Employment for librarians is concentrated in public and academic libraries. Competition for employment opportunities in these settings is extremely strong, especially for full-time positions. Most often a master's degree in Library and Information Studies along with significant library work experience are required. Entry-level employment opportunities are often part-time and contract positions. Those new entrants who are able to seek employment anywhere in B.C., Canada or the United States may have better prospects than those restricted to one geographical location.

The COPS forecast of employment openings for librarians may underestimate the number of private sector opportunities for those willing to work as information specialists. There are growing opportunities in information management in settings other than traditional libraries, examples of which include such non-traditional employers as corporations, consulting firms and information brokers. The fields of information brokering, consulting (information access and validation) and database marketing will provide librarians with much, and possibly the majority, of the growth in new employment opportunities.

Librarians with prior undergraduate degrees in such fields as administration, languages, computer science or engineering have a definite advantage. Librarians who are flexible, open-minded and able to work independently and have good communication skills and a sound general knowledge will also have an advantage in obtaining work. Knowledge of technology and good teaching methods will be increasingly important as well.

Young graduates will still need to use initiative to find openings in the job market. Those who will be best prepared for the few employment prospects will be specialists in science or technology and those who are highly skilled in computer use or business research, especially for openings in research libraries.

Both *archivists,* and *conservators* and *curators* are very small occupations in B.C. There is expected to be little change in employment for these occupations. Altogether about 150 jobs will become available between 1998 and 2008 for these two groups, primarily to replace individuals due to retire. Given these conditions, only those applicants with the highest of qualifications would be serious candidates for employment in these fields.

Because of government funding restraint, museums will have to operate increasingly like businesses, deriving a substantial part of their revenues from sales of services and related products. Volunteers will continue to play a large part in museum activities, both at the day-to-day management level and through their contacts with the general public.

In addition to the economic challenges they face, museums will also have to come to terms with a broadening social fabric and changing public tastes. Museums will have to make greater use of new information and telecommunications technology in order to reach the general public more effectively, to extend their range of services and to increase the overall efficiency of their activities. Technology, in the form of videos, conversational terminals and characters in virtual reality, is radically changing the appearance of exhibitions. It is difficult to assess the impacts of these changes on exhibition budgets and curators' projects, but they appear to be substantial.

Data banks (such as Info-Muse and other worldwide information banks), in which collections are or will be catalogued and stored in computerized form, have revolutionized the work of curators, who now must master a new language in order to encode and consult information. The accelerated rate of change occurring in contemporary and future museums will call for continuous training, long-term skills adaptation and a high degree of versatility.

Although their traditional roles and specialties are still important, museum curators must also possess new skills in communications, marketing, team work, computer science and organization of training, as well as project, staff and financial management. Usually promotion to a head curator's position requires prior experience as an assistant curator or curator.

Industry observers believe that work for *conservators* and *curators* increasingly will be in the form of part-time or contract work or through self-employment. Those who are adept at using imaging techniques will be in the best position to compete for these opportunities.

Industry observers have also indicated that growing community awareness of heritage issues may lead to additional employment opportunities for archivists but there is likely to be a surplus of qualified candidates competing for these openings. Prospects will be best for those archivists who have strong computer skills.

Additional Information

UBC School of Library Archival and Information Studies http://www.slais.ubc.ca/

B.C. Library Association http://www.bcla.bc.ca/

B.C. Archival Network http://aabc.bc.ca/ca/

Related Occupations

librarians (5111):

- library managers (in 01/09 middle and other management)
- school librarians (in 414 secondary and elementary school teachers and counsellors)
- library technicians (in 521 technical occupations in libraries, archives, museums and galleries)

conservators and curators (5112):

- curatorial assistants (in 521 technical occupations in libraries, archives, museums and galleries)
- museum designers (in 524 creative designers and craftspersons)
- museum educators (in 512 writing, translating and public relations professionals)

archivists (5113):

- library, archive, museum and art gallery managers (in 01/09 middle and other management)
- archive assistants (in 521 technical occupations in libraries, archives, museums and galleries)

> ***One of the challenges facing librarians is to make access to the Internet easier for the general public and small business and help to steer their clients toward the appropriate information sources through the multitude of sources available.***

Writing, Translating and Public Relations Professionals

NOC 512

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	5,710	7,810	9,310

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
1,500	1,770	3,270

Annual Growth 1998-2008	1.8%
Main Industries of Employment	
Other Service Industries	25%
Printing and Publishing	17%
Other Business Services	11%
Employment by Region	
Lower Mainland	68%
Vancouver Island	19%
Northern B.C.	4%
Okanagan/Kootenay	8%
Self-employment	35%

Nature of the Work

Writers plan, research and write books, scripts, plays, essays, speeches, manuals, specifications and other non-journalistic articles for publication or presentation. They are employed by advertising agencies, governments, large corporations, private consulting firms, publishing firms and other establishments, or they may be self-employed.

Editors review, evaluate and edit manuscripts, articles, news reports and other material for publication or broadcast and they coordinate the activities of writers, journalists and other staff. They are employed by publishing firms, magazines, journals, newspapers, radio and television networks and stations, as well as by companies and government departments that produce publications such as newsletters, handbooks and manuals. Editors may work on a freelance basis.

Journalists research, investigate, interpret and communicate news and public affairs through newspapers, television, radio and other media. They are employed by radio and television networks and stations, newspapers and magazines. Journalists may also work on a freelance basis.

Specialists in *public relations* and *communications* develop and implement communication strategies and information programs, publicize activities and events, and maintain media relations on behalf of businesses, governments and other organizations. They are employed by consulting firms, corporations, associations, government, social agencies and other organizations, or they may be self-employed.

Translators translate written material from one language to another. *Terminologists* conduct research required to translate and interpret technical, professional and scientific vocabulary and material. *Interpreters* translate oral communication, such as speeches, proceedings and dialogue, from one language to another. Translators, terminologists and interpreters are employed by private translation and interpreting agencies, government, large private corporations, international organizations and the media, or they may be self-employed.

Main Duties

Novelists, playwrights, script writers, poets and *other creative writers* conceive and write novels, plays, scripts, poetry and other material for publication or presentation and may conduct research to establish factual content as well as to obtain expert opinions and other necessary information. *Technical writers* analyse material, such as specifications, notes and drawings, and write manuals, user guides and other documents to explain clearly and concisely the installation, operation and maintenance of electronic, mechanical and other equipment. *Copywriters* study and determine selling features of products and services and write text for advertisements and commercials. *Writers* may be expected to do desktop publishing and design work and to liaise with production staff.

Editors evaluate suitability of manuscripts, articles, news copy and wire service dispatches for publication or broadcast, and they recommend or make changes in content, style and organization. They read and edit copy to be published or broadcast in order to detect and correct errors in spelling, grammar and syntax, and they shorten or lengthen copy as space or time requires. They also confer with authors, staff writers, reporters and others regarding revisions to copy. They plan layout or format of copy according to space or time allocations and significance of copy, and they plan and coordinate activities of staff. Further, they assure production deadlines are met, plan coverage of upcoming events and assign work accordingly, and they may negotiate royalties with authors and initiate payments to freelance staff.

Journalists collect local, national and international news through interviews, investigation and observation and they write news stories for publication and broadcast. They receive, analyse and verify news and other copy for accuracy, and they arrange for and conduct interviews as part of research as well as for radio and television programs. In addition, they research and report on developments in specialized fields, such as medicine, science and technology, and they prepare regular feature columns and stories on specialized topics. Journalists also write editorials and commentaries on topics of current interest to stimulate public interest and express the views of a publication or broadcasting station. They may also write critical reviews of literary, musical and other artistic works based on knowledge, judgement and experience.

Public relations and *communications professionals* develop, implement and evaluate communications strategies and programs designed to inform clients, employees and the general public of initiatives and policies of businesses, governments and other organizations. They gather, research and edit material for internal and external audiences. They prepare or oversee preparation of reports, briefs, bibliographies, speeches, presentations and press releases, and they develop and organize workshops, meetings, ceremonies and other events for publicity, fundraising and information purposes.

They also prepare and deliver educational and publicity programs to increase awareness of museums, galleries and other tourist attractions. Further, they initiate and maintain contact with the media, arrange interviews and news conferences, train and prepare management to speak on behalf of an organization, answer written and oral inquiries for management, facilitate two-way communication between an organization and the public, and assist in the preparation of brochures, reports, newsletters and other material.

Translators translate a variety of written material, such as correspondence, reports, legal documents, technical specifications and textbooks, from one language to another, while maintaining the content, context and style of the original material. They also revise, edit, proofread and check translated material, and they may train and supervise other translators.

Terminologists conduct documentary and terminological research for the preparation of glossaries, technological files, dictionaries and resource centres, and they may provide consultative services to translators, interpreters and technical writers by preparing legal, scientific or other documents requiring specialized terminologies.

Interpreters interpret oral communication from one language to another, either simultaneously (as the speaker speaks) or consecutively (after the speaker speaks). They may also translate sign language to a spoken language and vice versa and interpret language for individuals and small groups travelling in Canada and abroad, and they may train other interpreters.

©Stone/Vancouver

Example Titles

writers (5121):
- speech writer
- advertising copywriter
- technical writer
- screen writer
- radio writer
- ghost writer
- creative non-fiction writer
- periodical writer
- essayist
- novelist
- poet
- copywriter
- scientific writer
- playwright
- television writer
- humorist
- short-story writer
- specifications writer

editors (5122):
- production editor
- technical editor
- advertising editor
- news editor
- sports editor
- copy editor
- associate editor
- apprentice motion picture and theatre, second assistant picture editor
- photo editor
- art editor
- manuscript editor
- script editor

journalists (5123):
- book reviewer
- broadcast journalist
- columnist
- investigative reporter
- news commentator
- network reporter
- newspaper critic
- researcher, radio or television
- correspondent
- news analyst
- reporter
- television news anchorperson

professional occupations in public relations and communications (5124):
- communications officer
- information officer
- media coordinator
- media relations officer

- press secretary
- public relations consultant
- publicity agent
- public affairs officer
- museum educator
- communications specialist
- publicist
- fund-raising consultant

translators, terminologists and interpreters (5125):
- literary translator
- court interpreter
- conference interpreter
- legal terminologist
- medical terminologist
- translator, official languages
- sign language interpreter
- interpreter for the deaf

Education and Training

Writers, editors and *publishers* often require a university degree in the area in which they wish to write, such as medicine or engineering, or a degree in English or journalism. *Public relations professionals* require a college certificate or a university degree in a relevant field. There are no other entrance requirements or relevant credentials because it is ability, as demonstrated by a portfolio of work, that is the most important hiring criterion. Volunteer experience can be helpful.

Colleges and university colleges in B.C. offer a variety of programs to help develop writing, editing and public relations skills. Kwantlen University College offers a two-year diploma in Journalism and Public Relations, which includes study of print journalism, public relations and electronic publishing. Applicants are expected to demonstrate knowledge and skills equivalent to grade 12 English and have keyboarding skills of 25 wpm. Admission requires submission of a résumé, attendance at an orientation session and a 500-word statement of career goals.

The University College of the Fraser Valley also offers an Associate of Arts (media and communications studies option) degree. This degree prepares students for entry or advancement into Simon Fraser University's (SFU) Bachelor of Arts degree in Communication.

Langara College offers a one-year certificate and a two-year diploma in Journalism for students with an appropriate university degree. These programs train writers for general news assignments and introduce them to many aspects of the communications industry. They are print-oriented, but offer sufficient opportunity for developing broadcast reporting skills. Applicants must have grade 12 or equivalent, demonstrable writing ability and a typing speed of 40 wpm.

The British Columbia Institute of Technology's School of Business offers a two-year Broadcast Communications diploma. This program prepares students for careers as reporters, newscasters and editors in radio and television. Admission requires high school graduation, proof of computer literacy and keyboard skills of 25 wpm, as well as submission of an essay about career goals, letters of reference, transcripts and a résumé outlining related experience. Previous studies in political science, history, psychology, business, law, computer science and other humanities are valuable.

Emily Carr Institute of Art and Design also offers a diploma and a bachelor's degree in electronic communication and publishing.

Camosun College has a two-year Applied Communications program that emphasizes a wide range of media skills, as well as the conceptual background required in order to make intelligent production decisions. Admission requires successful completion of an English placement test and keyboarding skills of 30 wpm.

Vancouver Community College offers a flexible part-time Electronic Publishing and Design Certificate program, which appeals to those seeking entry into the communications industry as well as those seeking to upgrade their skills.

Douglas College offers a two-year Print Futures Professional Writing diploma program. It is designed to prepare graduates to work as technical writers, communications officers or editors. By focusing on document writing, as well as communication theory, the program trains students in research, writing and editing, as well as desktop publishing. Admission requires basic skills in word processing, submission of a writing assessment, samples of written work, two letters of reference and a résumé.

College of the Rockies offers an advanced certificate in Technical and Professional Communications. The program is intended for professionals with a diploma or degree who need to upgrade their skills in online communication.

Capilano College offers basic and advanced certificates in Business Communications. These programs are usually completed by part-time study and include courses in business and technical writing, public speaking and freelance writing.

The University College of the Cariboo offers the only Bachelor of Journalism in British Columbia. This print-based degree program provides students with the skills and knowledge necessary to become communications specialists. Admission requires either two years of liberal arts at any post secondary institution in B.C. or a university degree.

The Creative Writing and Journalism Department at Malaspina University College offers introductory, intermediate and advanced-level courses in book publishing, dramatic writing (including writing for the stage and script writing for radio, television and film), fiction, journalism and poetry, leading to a B.A. with a major or minor in Creative Writing. Students have the opportunity to combine applied and creative writing skills with a background in all aspects of print and electronic publishing.

Programs that teach writing and journalism are also available at B.C. universities. The University of British Columbia (UBC) offers a program leading to a bachelor's degree in Creative Writing. Application is usually made at the end of a second year of university and includes submission of 30 to 35 pages of original writing in two or more genres. A master's program in Creative Writing is also available. UBC's Sing Tao School of Journalism offers a master's program in journalism. UBC also offers a diploma in Applied Creative Non-Fiction to individuals who have a bachelor's degree or equivalent and to mature students with considerable professional experience. Applicants must submit at least 30 pages of original material, containing samples of writing in creative non-fiction and at least one other imaginative form.

The University of Victoria (UVic) offers several options in this area. A bachelor's degree in Arts (Writing) or in Fine Arts (Writing) is available from the Department of Writing in the Faculty of Fine Arts. As well, a minor degree is offered jointly by the Faculty of Fine Arts and the Department of English in the Faculty of Arts and Science. This minor is available to those who complete a bachelor's degree in either faculty. This minor is designed for those who wish to be professional writers in a variety of areas, including journalism, publishing, business, industry and government.

Simon Fraser University's School of Communication offers an interdisciplinary program leading to a bachelor's degree in Arts. Students in this program concentrate their study in a variety of areas, including advertising and social marketing, interpersonal and intercultural communication, mass media/popular culture and publishing. A master's program and doctoral studies in Communications are also available.

Admission to bachelor's degree programs requires completion of grade 12. Because space and resources are limited, not all qualified applicants are admitted, so early application is recommended.

New entrants into the field of publishing may wish to consider leaving the province to participate in special courses offered by the Banff Centre for the Arts in Banff, Alberta. These short, intensive programs are highly respected and designed for those seeking first positions in the industry.

Programs are also available for those who have already completed a degree. The Department of Writing in the Faculty of Fine Arts at UVic offers a one-year postgraduate diploma in writing and editing. The Harvey Southam Diploma is designed for students with degrees who are looking for a professional credential that will lead to a career in writing and editing in journalism, publishing, government communication and corporate information services. Admission is based on grade point average, portfolio, referee reports and an interview.

Preparation for a career in publishing can be obtained through a unique program offered by SFU. The Canadian Centre for Studies in Publishing at SFU offers a program leading to a Master of Publishing (MPub) within the Faculty of Arts. This program is designed for full-time and part-time study and includes a four-month internship. Admission requires a bachelor's degree with a high grade point average, familiarity with the publishing industry and with Apple and IBM-compatible microcomputers, and competence in English.

Writers and public relations people need to be creative, resourceful and organized. They must have excellent language, word processing and interpersonal skills. A critical mind, as well as patience, tact and self-discipline are all desirable qualities. Ongoing education is generally necessary. Comfort with computer use and technological information systems, as well as familiarity with related fields such as desktop publishing and design, are assets. Fluency in another language may enhance employment opportunities (and allow movement into related fields, such as translation).

To work in the area of translation, a bachelor's degree in translation/linguistics, or training and experience, is usually required. A translator's or interpreter's certificate issued by the Society of Translators and Interpreters of B.C. may be required. Certification is granted upon successful completion of examinations.

A few programs are available for developing interpreting skills. UBC has a diploma in translation between French and English. A bachelor's degree or equivalent, or extensive work in the field, is required for admission. Proficiency in both written and verbal English and French is expected. All candidates must pass a translation proficiency examination, which includes précis writing and translations.

Douglas College offers a diploma program in Sign Language Interpreting. Langara College has a Realtime Reporting/Court Reporting Program. Students have options to complete a Stenoscription Certificate or a Realtime Reporting Post-Diploma Certificate. The Stenoscription Certificate certifies students as accredited transcribers using the stenotype machine and specialized software for rapid entry of data from audio dictation. The Realtime Reporting Post-Diploma Certificate accreditation is required to provide realtime services in courts and other venues for the hard of hearing community. Admission into either certificate program requires grade 12 and proficiency at touch typing. SFU offers courses in advanced interpreting for international business ventures.

Translators, in addition to a thorough knowledge of at least two languages, require writing skills, a good memory, excellent oral expression and an ability to concentrate. Being able to think quickly and clearly is vital. Sign language interpreters must be sensitive to the needs of deaf and hard of hearing people. More details on work as an interpreter/translator may be obtained from the Canadian Translators and Interpreters Council, 1402, 1 Nicholas Street, Ottawa, Ontario, K1N 7B7, or from the Society of Translators and Interpreters of B.C., 1322- 808 Nelson Street, Vancouver, V6Z 2H2.

Working Conditions

Most of the occupations in this group involve working 35 to 40 scheduled hours per week, though frequently more hours are required. The actual number of work hours will vary according to circumstances and deadlines. The pace of work *will vary depending on the specific occupation within this group.*

The pace associated with work in translation services, public relations and magazine and book publication is usually steady, with some pressure of deadlines. The pace of working in newspaper or broadcast journalism is usually fast and sometimes exhausting.

Some of the workers in this group work in comfortable, private offices. Some (for example, many *creative writers*) even work out of their homes. Others (particularly *journalists*) must often work in noisy and sometimes crowded rooms filled with telephones, word processors and printers.

Although most of these workers have an office as a base of operation, many of their duties are performed elsewhere. Journalists are frequently out of their offices gathering news or other information on local and regional events or trends while *public relations professionals* must often venture out to conduct research or attend meetings or promotional functions.

Work schedules are often shifted or rearranged in order to meet deadlines or deal with late-breaking stories or client emergencies. Unpaid overtime and working evenings, weekends or even around the clock are not uncommon for writers, editors, journalists or public relations professionals. *Translators, terminologists* and *interpreters* may have a less volatile work schedule.

In 1995 the average annual earnings for this occupational group were $27,700. Almost half of this group worked full time for the full year, and their average earnings were $39,300. The respective all-occupation averages were $27,900 and $39,400. Editors had higher earnings, with an average of $32,700 ($43,800 full time, full year). Translators, terminologists and interpreters who worked full time for the full year were paid $26,400 on average. However, the average annual earnings for all workers in that occupation were only $16,000, reflecting the large proportion of workers in that field who are employed part time. Qualified, experienced public relations professionals can earn high salaries.

The number of employed workers in this occupational group increased from 5,710 in 1990 to 7,810 in 1998. Public relations professionals (35%) and writers (32%) are the largest occupations in the group.

Self-employment for the entire group stands at 35%, but the figure is much higher for writers (69%) and lower for public relations professionals (14%) and editors (15%). By comparison, the rate of self-employment across all occupations in B.C. is 15%. Part-time employment for the entire group stands at 27%, but as mentioned, it is more common for translators, terminologists and interpreters (41%). The all-occupation rate for part-time employment in B.C. is 26%. Unemployment for the entire group is less than the all-occupation average and is lowest for writers, most of whom are self-employed.

About 27% of the entire group (and 41% of translators, terminologists and interpreters) work only part of the year, reflecting the large amount of contract work in this occupational group. Jobs for this group are found in many different industries, but the largest concentrations are in consulting, printing, publishing, business services and radio/television. These workers are mostly located in the Lower Mainland (68%) and on Vancouver Island (19%).

Women make up 56% of the entire group and account for 68% of translators, terminologists and interpreters and 65% of public relations professionals. The proportion of workers aged 15 to 24 is significantly less (6%) compared to the all-occupation average for this age group (15%). This reflects the higher levels of education and experience required to secure work in this group. There is a high proportion of writers aged 65 and older (12% compared to the B.C. average of 2%), possibly because of the high self-employment, freelance nature and lack of conventional workplace restrictions and expectations associated with this line of work.

Employment Prospects

The newspaper and broadcasting industries are sensitive to economic ups and downs, because these industries depend on advertising revenue. During recessions, few new journalists are hired and some lose their jobs. The job outlook for the entire occupational group to the year 2008 calls for growth at about the all-occupation average. There are 3,270 total employment openings projected in B.C. between 1998 and 2008. The total number of openings includes an estimated 1,500 new jobs created as a result of growth and 1,770 for replacement needs due to retirement.

About one-third of those employed in this large occupational group are *writers*. The employment forecast for writers to the year 2008 calls for growth that is about the same as the all-occupation average. Between 1998 and 2008 there will be 930 projected employment openings, about 40% of them as a result of growth in the industry and about 60% to replace individuals due to retire.

Overall demand for books is expected to fall somewhat, but the field of children's literature is flourishing, and some specialized publishing houses have been very successful in foreign markets. The demand for technical writers is expected to increase, in part because of the continuing expansion of scientific and technological information, and the need to communicate it to others. Opportunities also exist for technical writers to write users' guides, instruction manuals and training materials for the growing high technology and electronics industries. This work requires writers not only to be skilled technically but also to be able to keep pace with knowledge about changing technology.

Movies and television are the most lucrative areas for writing, despite the limited number of career openings. Writing for television and movies has its own specific requirements. Aspiring script writers can increase their chances for employment by joining script-writing teams that include experienced script writers or by participating in shows that purchase sketches. These surroundings develop team spirit and should profit script writers, because in this industry, text is a raw product subject to modification by other artists.

Broadcasters, even in publicly-owned networks, are turning increasingly to private producers for their supply of programming. Production houses are looking continually for sketches, short stories, novels and scripts.

Advertising will be shaped to an ever-greater degree by the media. Advertising copywriters should be aware of trends and be familiar with different media. New technologies, such as virtual reality, multimedia and interactive media, will challenge writers' creativity. Infomercials, for example, will require that advertising copywriters be skilled in script writing. Contract work will become more prevalent for advertising copywriters. Those who have skills and background in business and marketing will be in the best position to obtain work in this area.

Creative writers, such as novelists, playwrights and poets, will continue to find it challenging to make a living from their writing. Like creative and performing artists, such as musicians, actors and painters, the few employment prospects available to them will take the form of temporary projects.

Computers are changing the way writers work. Written material is now easily transferred between writers and publishers via e-mail and Internet links. The Internet continues to transform the way in which writers conduct research by providing them with information and data from all over the world in readily accessible formats. The Internet has also provided many employment opportunities for writers who produce material for Web pages. Writers who have good computer skills will have an advantage over others seeking work in this field.

The employment forecast to the year 2008 is for growth below the all-occupation average for *editors*. This is a very small occupation in B.C., with just 230 projected employment openings through to 2008, 30% as a result of growth in the industry and 70% due to retirements. While the printing and publishing industry in B.C. is growing, there has not been a corresponding increase in demand for editors. Editors tend to work in the traditional areas of newspaper and printed publication fields. The fastest areas of growth for writers are in fields such as the Internet where writing is less formal and does not necessarily require the services of an editor.

The employment forecast for *journalists* is for growth that is about the same as the all-occupation average. A total of 480 openings for journalists are expected through to 2008, 42% to accommodate growth in the industry and 58% due to retirements. Those who can write on scientific or technical subjects will have a particular advantage in the labour market. The emergence and popularity of new technologies, such as personal computers and innovative software programs, results in a positive outlook not only for technologically oriented journalists but also for technical writers.

Journalism graduates have the background for work in closely-related fields, such as advertising and public relations. Journalism-related skills, such as media relations knowledge and team work, are sought after in the public relations field where there are potential jobs for journalists and researchers.

During recessions, versatility and knowledge of various media are major assets for journalists seeking greater job opportunities.

Employment prospects for broadcast journalists saw limited growth due to rationalizations during the early and mid 1990s. Prospects are improving due to the emergence of electronic technologies and the growth in the Internet. Greater use will be made of multi-skilled individuals, sub-contractors and freelance participants. Computerized production of programming is expanding every year. The phenomenon is creating a demand for creative journalists with computer skills. Equipment streamlining and the use of robots require radio-television journalists who are multidisciplinary (for example, knowing know how to operate a video camera is an asset). By using computers, journalists and reporters can now play a greater role in offline editing. Access to computerized databanks and the Internet makes journalists' and researchers' work easier. Those familiar with databanks and how to use them have a decided advantage.

For print journalists, the Internet has led to a boom in magazines, especially those dealing with computers, networks or multimedia. This growth should spur demand for specialized journalists who can write articles for Web pages on specialized subjects.

The ongoing consolidation of community and regional newspapers may be a limiting factor for employment growth in traditional print based journalism, despite the recent strengthening of this part of the newspaper market. Opportunities for news writing and editing positions on small daily and weekly newspapers and in small radio and television stations, where the pay is low, should be better than those in larger media markets where there is more competition.

The employment forecast for *public relations professionals* calls for growth that is faster than the all-occupation average. A total of 1,260 openings are expected to the year 2008, 50% to accommodate growth in the industry and 50% to replace those due to retire. Corporations, non-profit organizations and government agencies are becoming increasingly aware of the need to develop and maintain a positive corporate image. As a result, work opportunities in this occupation are available mainly through consulting firms and self-employment.

Consultants are increasingly called upon to participate in the strategic planning of a firm's communications, rather than just to perform occasional work. Clients also expect proof, measurable in both quantity and quality, that their communications campaigns are bringing in results. Strong analytical skills and the ability to develop new methods of measurement are in great demand. As a result, communications specialists must become more specialized.

Communications in finance is another promising niche for communications and public relations specialists. Financial communications specialists are responsible for keeping investors informed about a company, determining possible objections and transmitting them to the directors. Besides skills in finance, very strong credibility is essential. The demand for financial communications specialists is high because investors are occupying a growing presence as shareholders and are requiring sophisticated information.

It is believed that the labour market for public relations professionals will remain healthy, and there should still be solid prospects for workers in this occupation, although many of them may be in the form of part-time work, contract work or self-employment.

The employment forecast for *translators, terminologists* and *interpreters* calls for growth that is much faster than the all-occupation average. This is a very small occupational group of 570 individuals, but it is expected that there will be a total of 370 employment openings between 1998 and 2008, 62% as a result of growth and 38% due to retirement. Much of this projected growth will be found in the private sector, where over 78% of the jobs can be found.

Prospects for translators will be best for those who are fully fluent (have both written and verbal abilities) in languages that have growing importance in trade or are used in fast-growing communities in B.C. Those who can read, write and speak Mandarin, Cantonese, Japanese or Punjabi may have an advantage in the labour market. Increased trade with Mexico and with some of the South American countries in future years could open up new opportunities for translators with a good command of Spanish. In addition, many companies that have difficulty recruiting technical writers are turning to translators to have the work done. Employment prospects are good for translators familiar with scientific and technical fields. Professional translators knowledgeable about law, ecology, biology and pharmacy will also be in demand.

Computers have become indispensable equipment for translators. They now must have a sound knowledge of the computerized tools at their disposal (terminology banks, spell checkers, lexicographic databases and desktop publishing). Computer-aided translation may also take on greater importance in the future, especially in very technical areas such as meteorology.

Many of these professionals are self-employed or have their own businesses. Companies increasingly are cutting back on their permanent staff and sending work out to sub-contractors. Expansion of freelance work can be expected to continue.

As well as an excellent knowledge of the source and target languages, translators must have a good general knowledge, mental dexterity and editing skills. Demand is concentrated mainly in large urban centres. Text translators may live outside these areas because of increasing use of computer based "communications," such as e-mail and the Internet.

Interpreters mainly provide services at conferences, for discussion groups (escort-interpreters for trade delegations, for example) and in the legal field. This may require a lot of travel. Job openings are limited. Most interpreters work as freelancers, and many are also translators. Conference interpreters must have a high degree of physical and mental endurance, intense powers of concentration, mental flexibility, rapid mental assimilation skills, good elocution and pleasant voices.

Employment prospects are limited in the terminology field. Many terminologist positions were eliminated in the 1990s, and translators often do their own terminology research. In addition to an excellent knowledge of language and computer skills, terminologists should have a sound general knowledge and a high degree of intellectual curiosity. A sense of organization and an analytical mind are essential for managing long-term projects (for example, thematic research). Flexibility, persuasiveness and team work are skills much sought after in this profession.

Additional Information

For *writers*
Federation of B.C. Writers http://www.swifty.com/bcwa

Writers Guild of Canada
http://www.writersguildofcanada.com

Writers Union of Canada http://www.writersunion.ca

Banff Centre for the Arts http://www.banffcentre.ab.ca/CFA

For *journalists*
Canadian Association of Journalists http://www.eagle.ca/caj

For *professional occupations in public relations and communications*
Canadian Pubic Relations Society http://www.cprs.ca

For *translators, terminologists and interpreters*
Canadian Translators and Interpreters Council
http://www.synapse.net/~ctic

Related Occupations

writers (5121):

- song writers (in 513 creative and performing artists)

editors (5122):

- editorial assistants (in 145 library, correspondence and related information clerks)
- film editors (in 513 creative and performing artists)
- managing editors (in 01/09 middle and other management)
- map editors (in 225 technical occupations in architecture, drafting, surveying and mapping)
- sound editors (in 522 photographers, graphics arts technicians and tech occupations in motion pictures, broadcasting)

journalists (5123):

- announcers and other broadcasters (523)
- photojournalists (in 522 photographers, graphics arts technicians and tech occupations in motion pictures, broadcasting)

professional occupations in public relations and communications (5124):

- advertising specialists (in 1122 professional occupations in business services to management)
- marketing consultants (in 416 policy and program officers, researchers and consultants)
- public relations clerks (in 145 library, correspondence and related information clerks)
- public relations managers (in 01/09 middle and other management)

translators, terminologists and interpreters (5125):

- language instructors (in 4131 college and other vocational instructors)
- linguists (in 416 policy and program officers, researchers and consultants)

Creative and Performing Artists

NOC 513

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	9,510	11,850	15,460

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
3,610	1,180	4,790

Annual Growth 1998-2008	2.7%
Main Industries of Employment	
Amusement and Recreation Services	39%
Education	28%
Other Service Industries	20%
Employment by Region	
Lower Mainland	72%
Vancouver Island	15%
Northern B.C.	3%
Okanagan/Kootenay	9%
Self-employment	59%

Nature of the Work

Producers, directors, choreographers and related occupations oversee and control the technical and artistic aspects of film, television, radio, dance and theatre productions. They are employed by film production companies, radio and television stations, broadcast departments in advertising companies, sound recording studios, record production companies and dance companies. They may also be self-employed.

Conductors, composers and *arrangers* conduct bands and orchestras, compose musical works and arrange instrumental and vocal compositions. They are employed by symphony orchestras, bands, choirs and sound recording companies, or they may be self-employed.

This occupational group includes musicians, singers and teachers of vocal and instrumental music. Musicians and singers perform with orchestras, opera companies and popular bands in establishments such as concert halls, lounges, theatres and recording studios as well as in film and television. Music teachers teach in conservatories, academies and private homes.

This group also includes dancers and dance instructors. Dancers are employed by ballet and dance companies, television and film productions, night clubs and similar establishments. Dance instructors are employed by dance academies and dance schools.

Actors perform roles in motion picture, television, theatre and radio productions to entertain audiences. Actors are employed by motion picture, television, theatre and other production companies. This group includes acting instructors employed by private acting schools.

Painters, sculptors and *other visual artists* create original paintings, drawings, sculptures, etchings, engravings and other artistic works. They are usually self-employed. This group also includes art instructors and teachers who are usually employed by fine and visual arts departments in public colleges, at private art schools and in high school programs.

©Stone/Vancouver

Main Duties

Film, television and *radio producers* plan, organize and coordinate the production of motion pictures, television shows and radio programs, engage directors and other production personnel, and determine treatment, scope and scheduling of production. *Directors* interpret scripts, select the cast and advise in the interpretation and delivery of the performance. They also direct rehearsals, filmings, broadcasts and performances and confer with crew and production specialists throughout production and post-production to achieve desired presentation. *Choreographers* create dances for film, theatre and television performances that convey stories, ideas and moods and direct rehearsals for dancers to achieve desired interpretation.

Related occupations include art directors, film editors, record producers and directors of photography. *Art directors* plan, organize and direct the artistic aspects of motion pictures, stage productions and television shows by overseeing the design of sets, costumes, furnishings and props to create portrayals of period and setting. *Film editors* edit motion picture film and arrange film segments into sequences to achieve continuity and desired dramatic, comedic and thematic effects.

Record producers plan and coordinate the production of musical recordings, direct musicians and singers during rehearsals and recordings, and manage technicians involved in duplicating, dubbing and mastering of recordings. *Directors of photography* coordinate and direct the photography of motion pictures, supervise camera operators and other crews as well as determine lighting, lenses, camera angles, backgrounds and other elements to achieve a desired visual effect.

Conductors select and interpret musical works and lead bands, orchestras and choirs during rehearsals and performances. *Composers* create musical compositions, such as television and film scores, theme music, songs and symphonies. *Arrangers* adapt and modify musical compositions to convey desired themes and to suit particular instrumental and vocal performances.

Musicians play one or more instruments as soloists or as members of a musical group before audiences or for recording purposes. *Singers* sing musical arrangements as soloists or as members of vocal groups before audiences or for recording purposes. *Teachers of music* or *voice* teach technique, interpretation and music theory to students through private or group lessons.

Dancers practise and rehearse dance routines under direction or instruction to achieve desired interpretation and presentation. They perform dances as soloists or as members of groups before live audiences or for film or television. They also train and exercise to maintain the required levels of ability and fitness, and they may choreograph their own performances. *Dance instructors* teach dance technique and artistic interpretation to amateur and professional individuals and groups. They teach the techniques, cultural origins and symbolic meanings of native, ethnic and folkloric dances, and offer recreational dancing lessons, such as ballroom dancing, and they prepare dance students for specific auditions and performances.

Actors study and rehearse lines, gestures and expressions to interpret a role. They portray roles in motion pictures, television shows, theatre productions, radio dramas, commercials and other productions. They may sing or dance as required by specific roles and may perform comedy acts in nightclubs alone or as members of comedy troupes. *Acting instructors* train students in interpretation of scripts, speech, movement and dramatic theory, and prepare acting students for specific auditions and performances.

Painters create drawings, paintings and other original artwork using oils, pastels, watercolours, charcoal, ink and other materials. *Sculptors* create sculptures, statues and other three-dimensional artwork by shaping, carving and fabricating materials such as clay, stone, wood or metal. *Art instructors* and *teachers* teach students in the techniques and methods of drawing, painting, sculpting and other forms of artistic expression.

Example Titles

producers, directors, choreographers and related occupations (5131):

- filmmaker
- director of photography
- record producer
- film editor
- cinematographer
- radio producer
- television producer
- stage director
- art director
- artistic director
- technical director
- apprentice motion picture and theatre, third assistant director

conductors, composers and arrangers (5132):

- lyricist
- music adapter
- musical director
- orchestrator
- choir director
- band leader
- song writer

musicians and singers (5133):

- session musician
- percussionist
- opera singer
- accompanist
- church organist
- guitar player
- instrumentalist
- recording artist
- vocalist
- music teacher

dancers (5134):

- folkloric dancer
- dance instructor
- interpretive dancer
- ballet teacher

- ballroom dancing teacher
- ballet dancer
- tap dancer

actors (5135):

- comedian
- drama coach
- acting teacher

painters, sculptors and other visual artists (5136):

- ink sketcher
- portrait painter
- silkscreen artist
- art instructor
- artist

Education and Training

For many occupations in this group, a combination of talent and technical skills is required. Many people who achieve success have a bachelor's degree or a master's degree in their field.

Musical training from a university or college or through private instruction is usually required in order to be a *musician, singer* or *music teacher*. Members of orchestras and other professional classical musicians and singers usually require a university degree in music. Conductors, composers and arrangers usually have a degree in music or have completed a program at a music academy or school of music. A period of specialized study related to conducting, composing or arranging is often required in addition to experience as a musician. In B.C. there is a full range of opportunities for studying music.

Those who want to teach music may want to register with the British Columbia Registered Music Teachers' Association (BCRMTA). However, it is not necessary to register to use the title of "Music Teacher " or to practise as a music teacher in B.C.

The music department at Douglas College offers a one-year Basic Musicianship certificate program designed to impart basic knowledge and skills. Admission requires completion of secondary school. Kwantlen University College offers a certificate in music. All applications are handled on a first-come-first-served basis, with placement into an appropriate ensemble by audition and/or interview. The program offers amateur musicians an opportunity to develop skills in all aspects of music, including music appreciation, aural musicianship, simple arranging, basic theory, performance and teaching.

Two-year diploma programs in music are offered at Camosun College, Capilano College, Douglas College, Kwantlen University College, Malaspina University College, Selkirk College and Vancouver Community College. These programs are designed to provide students with the skills required to be self-employed professionals. However, many of these programs, or courses within the programs, may be applied as credit toward a bachelor's degree in music at a university.

Some programs specialize in certain types of music, and others concentrate on performance, production, composing or arranging. Admission generally requires completion of secondary school, demonstration of knowledge of music theory rudiments and an audition or interview. Students who wish to study piano usually need a Royal Conservatory of Music grade 10. For all other instruments and voice, grade 6 or equivalent is usually required.

The Open University offers three different bachelor's degrees and a master's degree in Music. The Bachelor of Music (Jazz Studies) is designed for the self-employed or those who wish to teach music. Admission requires completion of the Capilano College Jazz Studies Diploma. The Bachelor of Music (Performance) is offered to graduates and students in collaboration with the Vancouver Academy of Music and the Glenn Gould Professional School of the Royal Conservatory of Music. The third undergraduate degree is the Bachelor of Music Therapy degree program, with a curriculum that balances and integrates academic and music requirements specific to music therapy with general education requirements. This program is offered in collaboration with Capilano College. Students who have completed the requirements of the Bachelor of Music Therapy degree program can opt for the Master of Music Therapy (MMT) degree through a shared-delivery arrangement with the Advanced Music Therapy Institute (AMTI), an independent, private educational institution in Vancouver.

The School for the Contemporary Arts at Simon Fraser University (SFU) offers a Bachelor of Fine Arts (BFA) majoring in music, with several options to allow for pursuit of individual interests.

The Faculty of Fine Arts at the University of Victoria (UVic) offers a bachelor's degree in music (BMus) and the UVic School of Music offers a two-year master's degree in music (MMus), with specialization in composition, performance, musicology, or musicology with performance. A three-year doctoral degree (PhD) in musicology is also offered by the School. Admission requires submission of recent work in the chosen area, and auditions and interviews are usually required.

The School of Music at the University of British Columbia (UBC) offers programs in performance and composition leading to a BMus, MMus and Doctor of Musical Arts (DMA), as well as programs in musical scholarship that lead to a BMus, Master of Arts and a PhD.

For those who want to teach music in the public secondary school system, UVic offers a Bachelor of Education (BEd) majoring in music. SFU offers a BEd (Elementary) majoring in music and a BEd (Secondary) minoring in music. UBC offers BMus programs designed for prospective school teachers and teacher education to augment an undergraduate degree in music. All BMus programs have a performance component.

Admission to music programs usually requires auditions or interviews.

There are many educational programs available in the *visual arts* to help develop and enhance visual and graphic artistic skills and knowledge. The industry is very competitive and is constantly changing. Completion of art programs is one way to begin a career as an artist.

Northern Lights College offers a one-year certificate program in Visual and Graphic Communication Arts, which emphasizes developing and refining a high quality portfolio. Candidates to this program are required to submit a portfolio for review. Northern Lights College also offers a two-year Associate of Arts (Fine Arts in Visual Arts) Diploma. This program is intended for students who may wish to transfer to a fine arts or arts education program at a university in B.C. Kwantlen University College also offers a full-time, one-year Foundation Certificate in Fine Arts.

Many colleges and university colleges in B.C. offer two-year diploma programs in fine arts/visual arts, which encourage students to explore a broad range of concepts, materials, techniques and processes. These programs assist students to develop personal interests, directions, and creative maturity, as well as to prepare high-quality portfolios in order to gain acceptance to advanced art and design programs or to demonstrate skills to prospective employers. Diploma programs are available at Camosun College, Capilano College, Kwantlen University College, Malaspina University College, Northern Lights College, North Island College, Okanagan University College, University College of the Cariboo and University College of the Fraser Valley.

Admission requirements for two-year diploma programs usually include completion of secondary school and submission of a portfolio of recent works and an essay about career goals. Many of the diploma programs, or courses within these programs, may be eligible for university transfer credit in Fine Arts and Education programs/degrees (see B.C. Transfer Guide for details).

Capilano College has an Art Institute that specializes in sculpture and printmaking and also offers a one-year post-graduate certificate program. Comparable to artist-in-residence programs, the Institute offers advanced studies to recent college, university or art school graduates, as well as to artists with several years' experience in sculpture or printmaking.

Okanagan University College offers a four-year BFA majoring in visual arts. Admission is very competitive and acceptance is based on academic standing and portfolio review. Students can apply upon completion of the two-year Fine Arts Diploma.

The Emily Carr Institute of Art and Design (ECIAD) offers programs for painters, sculptors, printmakers, animators, filmmakers, photographers and visual artists. ECIAD offers four-year degrees and diplomas in Fine Arts, Media Arts and Design. Prospective students must have secondary school or equivalent. Admission is very competitive and is based on grades, a portfolio, a personal essay and a special project.

SFU offers a BFA with a visual arts major. This program combines practical studio courses with theoretical and critical seminars. Entry is by interview and applicants must have completed first year university. A master's program is also available.

UVic's Department of Visual Arts in the Faculty of Fine Arts emphasizes contemporary art practices rather than applied or craft training. The program is designed to provide intensive studio experience in a critical setting. Students may work towards a BFA majoring in visual arts, or combine visual arts and other areas of study. In addition, UVic offers a master's degree in Fine Arts (MFA), focusing on drawing, painting, sculpture, printmaking or photography.

UBC's Department of Fine Arts offers bachelor's and master's degrees in arts or fine arts, as well as doctoral degrees. The program leading to the BFA normally consists of four full-time years of study. The first two years are in a general Bachelor of Arts (BA) program, and application to enter the BFA program is made while in the second year of study. UBC's MFA program focuses on painting and drawing, printmaking, photography and sculpture. Usually applicants have a bachelor's degree, although in special cases artists who demonstrate advanced artistic achievement are admitted. UBC also offers a master's degree in either education or arts, in the area of visual and performing arts in education, and offers a doctoral degree in this field.

Art instructors and teachers may be required to have a university degree or college diploma in a field related to art, plus several years of experience as a practising artist.

For *film, theatre* and *video artists* programs are offered at B.C. universities, university colleges, colleges and private schools. For actors and dancers, demonstrated ability based on an audition or previous work is generally an important hiring criterion. Teachers usually require experience.

University College of the Cariboo offers a one-year certificate program in Theatre/Performing Arts, with some courses transferable to a university fine arts program.

Douglas College has a two-year Theatre Program, which trains students in acting and directing, as well as in business and management aspects of the arts industry. Langara College offers a three-year diploma in theatre arts with an acting option. University College of the Fraser Valley offers a two-year Associate of Arts (Theatre) Degree as well as a two-year diploma in theatre arts. Capilano College offers a Theatre Certificate, as well as an Advanced Certificate in Theatre (ACT), which offers students practical experience in a specialized area of theatre. Malaspina University College offers a Bachelor of Fine Arts - Theatre university transfer program. This program enables students to complete up to two years of the Fine Arts program before transferring to a university. Admission to these programs usually requires completion of secondary school and an audition or interview.

Producers, directors and film editors usually require a university degree or college diploma in performing arts, broadcasting, theatre production or film studies, as well as experience in a technical or production occupation in motion pictures, broadcasting or theatre. Choreographers require a university degree or college degree in dance, or a period of study at a school of dance and extensive training with a dance company.

SFU offers bachelor's degrees in film, theatre, and film and video. SFU also offers a BFA in dance, with emphasis on contemporary techniques, composition and experimentation. UBC and UVic both offer BAs, BFAs and MFAs in film and theatre, which allow for study in areas such as film production, directing, stage and screen playwriting, and play direction and production.

Successful artists in any field must be able to take direction, accept criticism and work well with others. Creativity and imagination are needed. Artists should be comfortable expressing ideas and emotions, as well as performing before an audience. Some knowledge of business is helpful since many artists are self-employed.

Working Conditions

Few workers, if any, in the creative and performing arts have a "9-to-5" type of work schedule. One constant feature of employment for this occupational group is that it is unpredictable and irregular.

Producers, directors, choreographers and *workers in related occupations* are constantly under pressure to meet work schedules, stay within budget restrictions, resolve personnel disputes and put together a production that will appeal to enough members of the public to be successful at the box office.

Actors must usually audition for roles and wait for parts. When they are offered a role, the work often calls for long hours with irregular schedules and possibly travel. Television actors need to deliver good performances with little preparation and should have stamina to deal with the heat and glare of studio lights, heavy costumes, makeup and adverse weather when filming on location. Evening work is an occupational necessity for a stage actor who must also deal with the pressure of delivering a flawless performance each night. Such a performance requires continuous memorization of lines and repetitive rehearsals. Most actors must also face the anxiety of intermittent employment and deal with frequent rejection following unsuccessful auditions.

Like actors, *dancers* must constantly audition to obtain temporary work. When they do find work, they are faced with challenges similar to those of stage actors. These include evening work, repetitive rehearsals, long hours and irregular schedules. As well, because of the physical demands of dancing, the careers of dancers are usually over some time in their thirties. Some continue to work in the field as *choreographers, teachers, coaches* or *artistic directors*.

Musicians and *singers* also have to work evenings and weekends and spend much of their time in practice or rehearsal. For many musicians, securing work means travelling out of town, sometimes for prolonged periods. Because of the infrequent nature of work as a musician, many supplement their income with one or more part-time jobs outside of the music field. They may even work at a full-time job and perform or practise as a musician only during evenings or weekends. Musicians who are part of a city symphony or other such established organization can usually rely on a more regular schedule and planned events.

Conductors, composers and *arrangers* have working conditions similar to various other artists in this occupational group. Like the other performers, such as actors, musicians and dancers, conductors must be prepared to deliver solid performances in front of audiences. Composers and arrangers are more like painters or choreographers in that their work is carried out prior to the actual performances. All three of these occupations share the trait common to this occupational group in that employment is often temporary and work hours are usually irregular.

Painters, sculptors and *other visual artists* usually work in studios located in office buildings or their own homes. The studios are usually well-lit and ventilated, but these artists still endure prolonged exposure to odours from paint, glue, ink or other materials.

In 1995 the average annual earnings for all workers in this occupational group were $16,500. Only 22% worked full time for the full year, and they received an average of $29,800 in earnings. The respective all-occupation averages were $27,900 and $39,400. The average earnings of managerial workers in this group, such as producers, directors, choreographers, composers, conductors and arrangers, were higher than those of performing artists, such as musicians, singers, dancers and actors, as well as the average earnings of visual artists. Of course, while many in this occupational group have low earnings, for actors, directors, producers and others working in international productions, earnings can be exceptionally high.

A recent graduate survey found that college graduates who found employment in this occupational group had a wide range of earning levels. Those producers, choreographers and directors who found employment in their field earned on average $2,430 a month for full-time work (about $29,200 a year). College graduates who found employment as painters and other visual artists earned approximately $1,230 a month for full-time work (about $14,800 a year).

The number of employed creative and performing artists in B.C. rose from 9,510 in 1990 to 11,850 in 1998. The largest occupations within this group are musicians and singers (42%) and painters, sculptors and other visual artists (20%). More than half of all the workers (59%) are self-employed, and 55% work part time. For producers, directors, choreographers and related occupations, self-employment stands at 38%, and just 18% work part time. Self-employment is also lower among actors (38%) and dancers (42%), but it is higher among painters, sculptors and other visual artists (77%) and conductors, composers and arrangers (69%).

The unemployment rate in this group is a little lower the all-occupation average. However, as an example of the diversity among this group, unemployment stands at almost 10% for actors, while it is non-existent for composers, conductors and arrangers. It is important to note that, while unemployment for the whole group may be just below the all-occupation average for the province, there may be employment in another field while waiting for the desired work in these creative or performing fields.

Approximately 55% of this group work part time, and part-time work is even more common among musicians and singers (70%) and actors (65%), but it is not as prevalent for producers, directors, choreographers and related occupations (18%) or for composers, conductors and arrangers (24%). These statistics reflect a labour market that is heavily oriented toward project-to-project work.

The industries that employ the largest number of workers in this group are amusement and recreational services (39%) and education (28%). A substantial number of producers, directors, choreographers and those in related occupations are also employed in radio and television, while more than half the musicians and singers are employed in some aspect of the education industry.

Most workers in this group are located in the Lower Mainland (72%) and on Vancouver Island (15%). The Lower Mainland is home to even greater proportions of B.C.'s producers, directors, choreographers and related occupations (83%) and its actors (93%), while Vancouver Island has a larger share of the province's painters, sculptors and other visual artists (24%).

Women account for 53% of this group. They account for a much higher proportion of dancers (86%) but a lower proportion of those in the subgroups of producers, directors, choreographers and related occupations (34%), composers, conductors and arrangers (23%) and that of actors (41%). The age distribution is not substantially different from that of the all-occupation average, except in the case of dancers who are mostly in the younger age groups.

Employment Prospects

This is a very large occupational group comprising a diverse range of artists employed in the music, dance, film, radio, television and fine art industries. The Canadian Occupational Projection System (COPS) forecast for this occupational group is for growth that is much faster than the all-occupation average. Growth is projected to be 2.7% per year to 2008. A total of 4,790 openings are expected over the ten year period to 2008. About 75% of these openings will be new jobs as a result of employment growth, and 25% will be due to retirements. While the majority of the occupations, such as producers, composers, musicians, singers, dancers and actors, will have greater than average employment growth, painters and other visual artists will experience little change.

Much of the work for this group is temporary regardless of what part of the entertainment industry they work in. Recording sessions, nightclub engagements, theatrical plays, television series, stage productions and artwork commissions are all of limited duration. As most of the available work for creative and performing artists is relatively short-term and not many workers in this group are employed full time for the full year, competition for available work in the creative and performing arts will remain strong. Many of the occupations in this group are very small, and this also creates competition, because the number of people aspiring to work in these fields far exceeds the amount of work available.

Producers, directors and *choreographers* is a diverse occupational subgroup that includes cinematographers, film directors and producers, and radio, television and record producers. Employment prospects for this group are projected to be above the all-occupation average through to 2008. Even though employment growth is good, only a small number of openings will be available due to the small size of this occupation. COPS forecasts 830 new and replacement jobs between 1998 and 2008.

Attendance at theatre and dance events is increasing due in part to baby boomers looking for new and different forms of entertainment now that their children are grown. Younger audiences are more difficult to attract because of young people's interest in new media and the Internet. When the Ford Theatre closed in Vancouver in 1999, B.C. lost an important venue for commercial theatre productions, at least for the short term. This will slightly reduce the work opportunities for producers and directors as well as for other performing artists. Audiences may turn to other theatre productions for live performances, which may increase employment opportunities in these settings. New forms of home entertainment compete with live performances for audiences.
Audio-visual production could profit, however, from changes as distribution systems such as the Internet increase their capacity to transmit more programs directly into the home.

Employment for radio and television producers is subject to budget constraints. Both audience fragmentation and slower growth in advertising revenues are forcing broadcasters to streamline their production costs. Television broadcasting is moving away from in-house productions and toward co-productions and purchases of foreign programming. As a result, fewer full-time directors are being hired, and contractual hiring is increasing.

Programming production is becoming more computerized, thus creating a demand for creative staff with exceptional computer skills. In order to use digital equipment, film editors, film directors and live performance directors will need to upgrade their skills. Novices do not usually enter these occupations because they usually require several years of experience.

Projected employment growth for *conductors, composers* and *arrangers* is expected to be faster than the all-occupation average. Because this is a very small occupational group, there will still be only about 130 new and replacement employment positions to 2008.

A growing number of composers use the MIDI (musical instrument digital interface) system to compose. Sound recording techniques are changing constantly as the equipment and software evolve. Knowledge of these techniques gives composers access to a wider range of job opportunities.

Many composers, conductors and musical directors are self-employed. Consequently they must develop their business skills. In particular, they need to learn how to manage their careers and market themselves. They must pay special attention to the business and administrative side of their work as well as participate more in decisions regarding marketing and sales, contract negotiations and copyrights.

Multimedia techniques will require greater cooperation both between and within various groups that did not previously work together. Communication and interpersonal skills will become necessary as representatives from different industries join their efforts to create new products.

Musicians and *singers* is the largest occupation within the creative and performing artists occupational group, with an estimated 4,950 employed in B.C. in 1998. Employment growth is expected to increase faster than the all-occupation average at 3.1% per year to 2008, and this will generate 1,770 new jobs. There will be an additional 510 openings to replace those retiring.

Future funding levels for radio and television broadcasting at the CBC will also directly affect job opportunities for musicians and singers in B.C. Many classical and popular music performers have to work at more than one job to make a living. Some teach in order to stay within a classical music environment. Increasingly, the trend in the labour market is toward short-term positions. To survive, musicians and singers are advised to become more musically versatile. For example, some opera singers work as chorus singers in major musicals.

Technological change has had major effects on the demand for musicians and singers through its influence on the creative process, production methods and administrative and technical procedures. For example, fewer job openings for studio musicians are expected because of the use of increasingly sophisticated synthesizers. The sounds of an entire orchestra can now be reproduced by a single musician using a synthesizer.

Most musicians and singers work freelance and consequently should be prepared to manage their own freelance businesses. They will need greater skills in self-promotion, career management, administration, accounting, marketing and contract negotiation. They should also be versatile and familiar with the audio technology used in various media.

Multi-disciplinary knowledge of pre-production and post-production are also important assets for musical directors who have increasingly specialized work teams to manage in this very competitive industry.

Employment for *dancers* is expected to grow at a faster rate than the all-occupation average. Since this is a small occupation there will still not be a large number of employment openings. Only 420 new and replacement positions are forecast to 2008. As is the case for most creative and performing artists, there are more dancers available than there are employment opportunities. Some professional dancers leave Canada to seek work in the United States or in the United Kingdom where there are more openings and more weeks of professional work per year. Those dancers who can also sing and act have the best chance of finding work in commercial theatre in B.C. As is the case with actors, dancers need to develop career planning and management skills. This is especially important since the careers of most dancers are over by the time they are in their thirties. Dancers need to be prepared to switch to a related occupation or an entirely different line of work.

Employment for *actors* in B.C. is projected to grow faster than the all-occupation average through to 2008. This is a small occupation, and even though the growth rate is high, only 730 new and replacement jobs will be available over the next ten years.

Continued growth in B.C.'s film industry has allowed more local actors to get work and earn credits in the industry. B.C.'s reputation as an international film production centre is firmly established, and B.C. is now the third largest film production centre in North America behind only Los Angeles and New York. Other factors that bring films to B.C. include the low Canadian dollar, year-round mild weather compared to Montreal and Toronto, locations that are vast, varied and widely spaced, and a time zone that is the same as Los Angeles, which makes travel and communications easy.

Funding for the arts is an important component of the demand for actors. In 1999 the Federal Government announced $20 million funding for Canadian film across Canada. It is likely that B.C. will see little of this, because much of the filming here is for American producers who mainly use American actors with Canadian locations and production crews. The Provincial Government now offers two tax credit programs, both domestic and foreign, offering film makers refundable corporate income tax credits. This should help B.C. attract good levels of production over the long run. Funding at all levels of government, although still contributing to the operation of live productions, has declined over the last ten years. Production companies have had to look for alternative sources of revenue, such as increased ticket sales.

The expansion of new television channels and new CRTC rulings will directly affect the job market for actors. Although the addition of new channels could create additional commercial production, the type of programming offered may not increase the demand for actors. With competition and pressure to keep costs down one would expect that well paying opportunities will be limited.

Most actors work freelance. Skills in career planning and financial management, contract negotiation and talent marketing are therefore valuable tools in this profession. Many actors have to make ends meet by working outside the entertainment field. It is often necessary that they leave the areas where they grew up to find employment in major production centres. It should be noted that initial contacts made with acting teachers, peers or other individuals in this field are extremely important.

COPS projects employment for *painters, sculptors* and *other visual artists* to grow more slowly than the all-occupation average. Only 400 new and replacement jobs will be available over the 10-year period to 2008. Most visual artists are self-employed, so they often have to create their own work prospects. Starting out and developing a reputation can be a gruelling and frustrating process for an aspiring visual artist. During this early period (and many other stages) of their careers, many of them will have to supplement their earnings with employment in another field. Those who hope to obtain commissions or contracts for their services will need to have built a strong portfolio to have a realistic chance at securing these opportunities.

Competition is fierce and prospects for visual artists have traditionally been scarce. Unfortunately, this situation is not expected to change. The ability to network with people representing such diverse organizations as art galleries, advertising or other creative agencies and government departments or ministries is an important asset. Many visual artists have their own Web sites on the Internet to provide a showcase for their work and to market their products.

Technology: There has been a great deal of technological change that has had an impact on occupations in the entertainment industry and particularly in the use of digital technologies. Composers use MIDI (musical instrument digital interface) systems to compose, and singers and musicians record their performances using the latest digital technologies. Film, radio and television producers are increasingly dependent on an array of recording, filming and broadcasting technologies. Fibre optics, satellite rebroadcasting and new distribution methods enabling pay-per-use billing are factors that are likely to have an impact on the demand for artists and composers in ways as yet not understood. On the one hand, an expanding choice for clients could be seen as a threat to live performances. On the other hand, the demand for composers specializing in recorded music could rise.

The most dramatic change taking place in the music and film industry is in distribution. The Internet has rapidly become a medium for transactional e-commerce and the delivery of entertainment products. The recent invention of digital video and music formats such as DVD and MP3 have revolutionized how movies and music can be distributed to consumers.

The MP3 format permits the conversion of large and cumbersome audio formats into small compressed files that are easily downloadable from the Internet. MP3 format has made music available and affordable to almost everyone who has a computer and has changed the relationships between consumers, artists and producers radically. This invention has resulted in the emergence of music-sharing networks that allow free downloads of a huge selection of music. This has raised copyright and royalty issues and made it difficult for performers and composers to receive royalties. The recording industry needs to ensure that the artists get compensated adequately and will probably try to block this practice through lawsuits or come up with new ways of incorporating music-sharing networks into their distribution methods. File-sharing technologies may eventually become central components of the music business, using technologies such as digital rights management or subscription-based download services. This may allow artists in the future to have total control and the ability to distribute their music without the need for record companies, which could make point recording companies obsolete.

Film Industry: Industry sources indicate that the film industry has seen rapid growth in B.C. in recent years, with employment growth at the average yearly rate in excess of 20% between 1978 and 1999. They suggest that the projections may be underestimated for those occupations associated with the film industry. In order to obtain a steady source of income, workers in this group may have to overcome obstacles that are anything but average.

Creative and performing artists who have studied their craft at university and have received graduate degrees in their respective disciplines have the best prospects of finding work as teachers of acting, music, dance or art.

For more information on factors that have an impact on career prospects in the culture sector, see the Employment Prospects section of NOC 522, Photographers and Graphic Arts Technicians.

Additional Information

B.C. Film Commission *http://www.bcfilmcommission.com*

Getting Into: the A.C.T!
http://www.artsjobs.bc.ca/welcome.html

StudyWeb *http://www.studyweb.com/links/4740.html*

For *producers, directors and related occupations*
Canadian Film and Television Production Association
http://www.cftpa.ca
http://www.ted.cftpa.ca

For *musicians and singers*
Pacific Music Industry Association *http://www.pmia.org*

For *actors*
Alliance of Canadian Cinema, Television and Radio Artists (ACTRA) *http://www.actra.com*

Canadian Actors' Equity Association *http://www.caea.com*

For *painters, sculptors and other visual artists*
Canadian Institute of Theatre Technology (CITT)
http://www.citt.org/frames.htm

Related Occupations

producers, directors, choreographers and related occupations (5131):

- managers in publishing, motion pictures, broadcasting and performing arts (in 01/09 middle and other management)
- photographers, graphic arts technicians and technical occupations in motion pictures, broadcasting and the performing arts (522)

musicians and singers (5133):

- professors of music (in 4121 university professors)
- secondary school music teachers (in 414 secondary and elementary school teachers and counsellors)

dancers (5134):
- other performers (in 523 announcers and other broadcasters)

actors (5135):
- other performers (in 523 announcers and other broadcasters)
- drama professors (in 4121 university professors)

painters, sculptors and other visual artists (5136):
- artisans and craftspersons (in 524 creative designers and craftspersons)
- graphic designers and illustrating artists (in 524 creative designers and craftspersons)

Skill Level B - Technical, Paraprofessional and Skilled Occupations

Technical Occupations in Libraries, Archives, Museums and Galleries

NOC 521

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	1,270	1,780	2,000

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
220	390	610

Annual Growth 1998-2008 1.2%

Main Industries of Employment

Education	82%
Local and Other Administration	7%
Other Service Industries	3%

Employment by Region

Lower Mainland	61%
Vancouver Island	16%
Northern B.C.	8%
Okanagan/Kootenay	15%

Self-employment 5%

Nature of the Work

Library and *archive technicians* and *assistants* assist users in accessing library or archive resources and assist librarians or archivists in cataloguing new acquisitions as well as conducting reference searches. They are employed by libraries and archives and by other establishments with library or archive services.

This group also includes workers who classify and catalogue museum and gallery artifacts, construct and install exhibits and displays, restore, maintain and store museum and gallery collections, frame artwork, conduct guided tours and perform other functions in support of curatorial and conservation activities.

Library and *archive technicians* and *assistants* are employed in libraries, archives and organizations with library and archive services, museums, galleries and retail organizations. They may also be self-employed. They may specialize in a specific type of collection. *Picture framers* and *taxidermists* may also be employed in retail settings, or they may be self-employed.

Main Duties

Library and *archive technicians* and *assistants* help users get information from library books, films, photographs, maps, documents and other library materials or archival records. They may also assist librarians and archivists in cataloguing new acquisitions, and conduct reference searches. This occupational group also includes reference and circulation assistants.

Recent advancement in information technology has changed the nature of library and archival work, and many technicians and assistants perform online reference searches. They also assist librarians in giving tours and providing children's programs and assist archivists to arrange for safe storage of historical records and documents.

Conservation and *restoration technicians* assist conservators to preserve and restore artifacts. *Curatorial assistants* help research, handle and store artifacts. *Museum guides* and *interpreters* conduct museum and gallery tours of exhibitions. *Museum registrars* and *cataloguers* classify and register artifacts as well as supervise inventory control. *Preparators* construct displays and dioramas and prepare artifacts for storage or shipping. *Picture framers* fabricate custom frames and mount paintings and other art work.

Example Titles

library and archive technicians and assistants (5211):
- library assistant
- library technician
- archive assistant
- circulation assistant
- reference assistant

technical occupations related to museums and galleries (5212):
- museum technician
- museum interpreter
- museum guide
- preparator
- taxidermist
- museum registrar
- restoration technician
- museum cataloguer
- curatorial assistant
- picture framer

- conservation technician
- museum extension officer

Education and Training

Employment as a *library technician* requires at least high school graduation, and completion of a program in library technology is most common.

The University College of the Fraser Valley and Langara College offer two-year Library Technician programs that prepare graduates for paraprofessional duties in a variety of library situations, usually working with a professional librarian or information specialist. Some of the courses included in these programs qualify for advanced credit in a degree program in this area at one of the public universities in B.C. Entrance requirements include completion of grade 12 or equivalent, competency in English and submission of transcripts and a resume.

People in this field should have good computer keyboard skills, good writing and speaking abilities, and an interest in sorting and organizing information. To be successful they must be capable of using a variety of computer applications to perform tasks in libraries and information centres. An ongoing interest in learning is desirable because this area of work changes quickly and is greatly affected by incorporation of new technologies. People employed in this field should also be comfortable interacting with a wide variety of people, and enjoy creating programs that meet public interests. Supervisory and administration skills are an asset.

For related work in this area, see the profile Librarians, Archivists, Conservators and Curators (511).

Working Conditions

In 1995 the average annual earnings for all workers in this occupational group were $18,400, with those who worked full time for the full year receiving an average of $29,800 in earnings. The respective all-occupation averages were $27,900 and $39,400. The average earnings of those working in museums and galleries were lower ($15,800 for all workers and $29,100 for those working full time, full year).

A recent graduate survey reports that monthly entry-level earnings for full-time *library* and *archive technicians* and *assistants* averaged $1,570 a month. However, the average weekly hours for these workers were part time (25hrs/wk) suggesting that many new entrants to this field do not immediately find full-time work.

This is a small occupational group. The number of employed workers in the entire group rose from 1,270 in 1990 to 1,780 in 1998. About 81% of the group work in libraries and archives.

Self-employment for the entire group stands at less than 5%. However, self-employment is much higher for *technical workers* in *museums* and *galleries* (18%) while it is almost non-existent for those in libraries and archives, where it stands at less than 1%. By comparison, the rate of self-employment across all occupations in B.C. is 15%.

About 47% of the entire group (50% of library and archive technicians and workers) work part time, compared to 26% for the workforce overall. The level of contract and part-time work is expected to increase for all these occupations.

The unemployment rate for the entire group is about the same as the all-occupation average but is higher for museum and gallery technical workers (over 13%). Just over half (31%) of the entire group work full time, full year.

Education is the industry in which 59% of the museum and gallery technical workers and a majority of workers (82%) in the entire group are employed. The rest of the entire group's workers are found in a wide range of industries, such as service industries, provincial administration and local governments.

The regional distribution is close to the all-occupation average, with 61% located in the Lower Mainland, 16% on Vancouver Island, 15% in the Okanagan/Kootenay and 8% in Northern B.C. Those working in museums and galleries are more evenly distributed between regions, with less than half in the Lower Mainland and greater representation in the other regions.

Women account for a clear majority (80%) of the workers in the entire occupational group but make up a smaller majority (57%) among museum and gallery technical workers. The age distribution is not markedly different from the all-occupation average. The average age of these workers is 39, close to the all-occupation average of 38. However, there is stronger representation in the 15 to 24 age group (16%) than is found in many white-collar professions.

Employment Prospects

Workers in technical occupations in libraries, archives, museums and galleries are employed primarily in the libraries of schools, colleges and universities. They also work for municipalities and in documentation centres of federal and provincial departments. Some positions exist in the private sector. Budget restraint at all levels of government will limit new job growth. According to the Canadian Occupational Projection System (COPS), the employment for technical occupations in libraries, archives, museums and galleries will grow more slowly than the average for all occupations. A total of 540 openings are projected to the year 2008 for *library* and *archive technicians* and *assistants*, and 70 total openings are projected for technical occupations related to museums and galleries. About two-thirds of these openings will be to replace workers who are expected to retire.

Industry sources agree with this growth rate forecast. However they do report that there is a current shortage of archival technicians. They indicate that this is primarily because there is no training program available in B.C.

Many graduates will have to turn to the private sector or consider self-employment. Some fields, such as information brokering, consulting (information access and validation) and database marketing, offer new employment opportunities. Those with knowledge or degrees in such fields as administration, computer science or engineering have a definite advantage. Documentation technicians may find themselves setting up their own document management businesses, which would provide expertise in archival and document storage and in document disposal management.

New technologies have had an effect on tasks performed by librarians and library technicians and assistants. Library and archival technicians increasingly use computerized cataloguing and database systems. The skill and ability to use this software is a fundamental requirement for library employees.

The Internet will change the way knowledge is circulated. Since the mass of data contained on the Internet is poorly organized, the creation of access protocols, catalogues and indexes could create new job opportunities for librarians. However, the growth of public access to the Internet may result in more centralized library services and thus force smaller libraries to downsize.

Budgetary constraints have forced many museums to reduce their staff. The variety of tasks and reduced number of employees in small and medium-sized institutions oblige staff to take on a wider range of duties. Employees are thus required to be increasingly versatile, which means having both technical and creative or design skills. As technicians must also provide technical support for archiving, it is a good idea for workers to develop computer and collection management skills. Economic uncertainty is also affecting the stability of jobs. An increasing number of employees are on contract, sometimes for many years.

Recruitment for technical occupations in libraries, archives, museums and galleries is done through traditional networking and advertising methods as well as through professional journals and newspapers.

Additional Information

Library Technicians' and Assistants' Interest Group
http://www.bcla.bc.ca/ltaig

Canadian Library Association http://www.cla.ca

Related Occupations

- archivists (in 511 librarians, archivists, conservators and curators)
- librarians (in 511 librarians, archivists, conservators and curators)
- library clerks (in 145 library, correspondence and related information clerks)
- assistant curators (in 511 librarians, archivists, conservators and curators)
- museum exhibit designers (in 524 creative designers and craftspersons)

Photographers, Graphic Arts Technicians and Technical Occupations in Motion Pictures, Broadcasting and the Performing Arts

NOC 522

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	4,610	5,800	7,490

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
1,690	1,500	3,190

Annual Growth 1998-2008 2.6%

Main Industries of Employment

Amusement and Recreation Services	32%
Other Service Industries	24%
Other Manufacturing	15%

Employment by Region

Lower Mainland	77%
Vancouver Island	11%
Northern B.C.	4%
Okanagan/Kootenay	9%

Self-employment 35%

Nature of the Work

Photographers operate still cameras to photograph people, events, scenes, materials, products and other subjects. Photographers are employed by photographic studios, newspapers, magazines, museums and government, or they may be self-employed.

Film and *video camera operators* operate motion picture and video cameras and related equipment to record news, live events, films, videos and television broadcasts. They are employed by television networks and stations, motion picture and video production companies, or they may be self-employed.

Graphics arts technicians produce and assemble artwork, photographs, lettering and other graphic art according to conceptual layouts and specifications, and they make designs for the Web and camera-ready for printing. They are employed by publishing, advertising and printing establishments and by television and film production companies.

Broadcast technicians operate control consoles and other broadcasting equipment to route radio and television broadcasts through transmitters and network lines as well as to monitor radio and television broadcasts. They are employed by radio and television broadcasting networks and stations.

Audio and *video recording technicians* operate equipment to record, mix or edit sound, music and videotape for motion pictures, television and radio programs, videos, recordings and live events. They are employed by film, video and concert production companies, sound recording firms, and radio and television networks and stations.

This occupational group includes a range of *technical* and *supervisory* workers who coordinate and perform specific activities for television, radio and motion picture productions, news broadcasts, theatre and stage productions and other live or recorded productions.

It also includes *assistant technical workers* who perform support duties related to broadcasting and the production of motion pictures and the performing arts. Both technical and support workers are employed by television and radio stations and networks, recording studios, motion picture and video production companies, and theatre and stage companies.

Another occupation included in this group is *motion picture projectionists* who are employed by movie theatres.

©Stone/Vancouver

Main Duties

Photographers study requirements of a particular assignment and decide on the type of camera, film, lighting and background accessories to be used. They also determine picture composition and make technical adjustments to equipment and the photograph subject. They may process exposed film and may use airbrush or other techniques to retouch negatives.

Film and *video camera operators* meet with the director and senior members of the camera crew to discuss assignments and determine filming sequences, camera movements and picture composition. They select and set up camera equipment to be used, they attach the lens, filters and film magazine to the camera, they adjust the focus, exposure, lighting and other camera settings, and they operate film or video cameras to record news, live events, films, videos and television broadcasts. They also label and record contents of exposed film, complete report sheets and test and maintain equipment.

Graphics arts technicians encompass a number of different occupations with a wide range of duties. *Animation painters* paint or ink individual cells of animated film according to the animator's specifications. *Copy stylists* designate type size and face to conform with layout and the allocated space of copy to be printed on advertising pages of periodicals or catalogues. *Paste-up artists* arrange and mount art elements, photographs and text on paper according to the designer's or artist's layout in order to provide camera-ready copy. They also scale and crop art elements and prepare rules, borders and other mechanical elements. *Sign painters* lay out and paint letters, figures and designs for advertisements, billboards and business signs using layout instruments and painting equipment. *Stencil makers* lay out and cut stencils to desired specifications. *Lettering artists* paint and draw precise lettering for advertisements, books and other printed materials.

Broadcast technicians monitor the broadcast quality of live and taped radio and television programs as well as operate and monitor broadcasting studio microwave and other transmitting equipment to broadcast and receive signals. They also make emergency repairs to equipment, substitute programs in case of signal failure, set up and operate consoles to pick up feed sources from different locations, and put radio or television programs and commercials to air. They may supervise other broadcast technicians.

Audio recording technicians operate audio equipment to record and edit music, dialogue and sound effects for films, videos, radio and television programs and recordings. They also operate audio consoles to mix music and sound at concerts and live events. In addition, they operate dubbing machines to play back edited dialogue, music and sound effect tracks from different sources, in synchronization with motion picture film. *Video recording technicians* operate videotape recording and editing equipment to record videos, television programs, concerts and live events, as well as to edit video tape after production. These technicians may supervise and coordinate the work of other audio and video recording technicians.

The duties of *technical workers* vary according to their specific occupation. *Floor directors* coordinate camera operators and other technical staff, and they cue announcers, actors and performers during news broadcasts and television program tapings. *Key grips* supervise grips and stagehands who rig, place, move and dismantle, backdrops, scenery and other stage equipment. *Gaffers* supervise lighting crews, and *lighting technicians* set up, operate and make repairs to lights and other electrical equipment in studios and on sets and stages. *Sound technicians* operate boom equipment. *Stunt coordinators* and *special effects technicians* design and coordinate special effects, such as fires, explosions and crashes. *Make-up artists* apply cosmetic and special effects make-up on actors and other performers. *Costume set supervisors* and *costume technicians* oversee the acquisition and maintenance of costumes and wardrobes and design the "look" of the costumes. *Script supervisors* keep detailed notes of all actions, continuity, positions and camera angles as well as photograph and date scenes.

Others in this group include workers who prepare television and radio schedules, audition and cast performers for roles and schedule, oversee rehearsals, coordinate set activity, provide catering, transportation for cast, dressing rooms, and so on.

The duties of assistants and support workers also vary with their specific occupation. *Grips* set up and operate mobile camera platforms. *Motion picture projectionists* load film reels onto movie theatre projectors. They adjust focus, sound levels and other projector and theatre settings, and they maintain projection equipment. *Props persons* and set dressers research, build and maintain props and other set decorations. *Stagehands* and *riggers* rig, place, move and dismantle sets, backdrops, scenery and other stage equipment. *Costume attendants* clean, maintain, transport and store costumes, and they assist performers to dress in costumes.

Example Titles

photographers (5221):
- photojournalist
- industrial photographer
- scientific photographer
- forensic photographer
- commercial photographer
- portrait photographer
- aerial photographer

film and video camera operators (5222):
- film camera operator
- electronic news gathering (ENG) camera operator
- assistant camera operator
- studio camera operator
- television camera operator
- motion picture camera operator
- video camera operator
- camera operator

graphic arts technicians (5223):
- silkscreen technician
- mechanical artist
- lettering artist
- apprentice sign painter
- sign painter
- scenic painters
- paste-up artist
- copy stylist
- stencil maker
- Web design technician

broadcast technicians (5224):
- master control room (MCR) technician
- regional transmitter technician
- senior MCR operator
- broadcast engineer
- broadcast transmitter operator
- switcher, broadcasting
- video transmission operator
- mobile broadcast equipment operator
- shortwave receiving station technician

audio and video recording technicians (5225):
- post-production technician
- recording engineer
- recording studio technician
- sound engineer
- audio technician
- sound mixer
- video and sound recorder
- sound effects editor
- sound technician
- radio technician
- video recording technician
- audiovisual technician

other technical occupations in motion pictures, broadcasting and the performing arts (5226):
- apprentice motion picture and theatre, assistant location manager
- key grip
- stage manager
- casting agent
- costume set supervisor
- apprentice motion picture and theatre, lighting technician (stage)
- lighting technician
- stage technician
- film technician
- program coordinator, broadcasting
- gaffer
- stunt coordinator
- special effects technician
- theatre technician
- set decorator
- set electrician
- assistant director
- floor director
- apprentice motion picture and theatre, first assistant make-up artist
- make-up artist

support and assisting occupations in motion pictures, broadcasting and the performing arts (5227):
- lighting assistant
- props person
- apprentice motion picture and theatre, set dresser
- set dresser
- apprentice motion picture and theatre, script supervisor
- script supervisor
- stagehand
- apprentice motion picture and theatre, costumer (film)
- costume attendant
- spotlight operator
- camera crane operator
- special effects assistant

- prompter
- apprentice motion picture and theatre, grip
- grip
- set dresser
- set builder
- projectionist
- motion picture projectionist
- production assistant, broadcasting
- apprentice motion picture and theatre, entertainment rigger
- rigger

Education and Training

It is possible to work in some areas of this field without formal training or with only on-the-job training. However, there are many educational programs available in B.C. in this area, and technologists/technicians usually do require some formal training. *Film* and *video camera operators* usually complete a diploma in broadcasting, audiovisual technology, or a related field. Completion of a program in broadcasting technology is usually required to become a *broadcast technician*. Formal training in recording engineering, audiovisual technology or a related field is usually required in order to work as an *audio* and *video recording technician,* although experience as a recording studio assistant may suffice. *Gaffers, lighting technicians, key grips* and other *stage technicians* usually complete a college program in technical production for theatre or an equivalent.

There are a number of educational programs of one year or less duration available in this field. Vancouver Community College (VCC) offers a nine-month certificate program in Digital Graphic Design for which applicants must submit a portfolio demonstrating artistic ability and graphic design skills. VCC also has a one-year certificate program in Graphic Communications and Production Technology. Students may opt for the diploma program, which is an additional 10 months. Study in this program emphasizes printing production. Northern Lights Community College has a one-year certificate program in Visual and Graphic Communication Arts, which includes courses on video production and television. North Island College offers a 10-month Professional Photography Certificate Program, which prepares students for entry-level positions in the photography industry.

University College of the Cariboo offers a one-year diploma program in Digital Art and Design, which includes training in computer graphics and animation skills. Applicants must have some fine arts education at the university level and must submit a portfolio of work for evaluation. The University of British Columbia (UBC) offers a one-year certificate in Multimedia Studies. Applicants must have English proficiency, familiarity with computers and be able to work with DOS/Windows or Mac OS.

A wide variety of two-year programs are also available. The British Columbia Institute of Technology offers Broadcast Communications, with options in radio, television or broadcast journalism. Completion of secondary school is required. Camosun College has an Applied Communication program, which includes study of photography, graphics, video, audio and computing. Capilano College offers Media Resources, a program which includes photography, film, audio, video, animation and computer courses. Langara College offers a Journalism diploma program, which is print-oriented but offers opportunity for developing photography and radio and television reporting skills. This program includes radio and television, fibre optics and computer systems. Graduates may find immediate employment, move into third year communications studies at Simon Fraser University (SFU) or enter other post secondary institutions to complete degrees in related areas.

Langara College offers a two-year diploma program in Professional Photo-Imaging. Study topics in this program include multi-image and videography, digital photography and photo journalism. Admission requires completion of secondary school and submission of a portfolio.

Langara College also has a Theatre Arts program with a production option. Applicants to this program must have demonstrable talent and good health and must undertake an audition. Douglas College has a program in Stagecraft, which trains students for work in theatrical productions. Study topics include sound, lighting, set design and construction, painting, and stage management. Malaspina University College has a two-year Technical Theatre diploma program, which trains students for work in areas such as management, lighting and sound, and directing. The University College of the Fraser Valley (UCFV) has a two-year program in Graphic Design. Applicants to this program are chosen based on a submitted portfolio and level of performance on several entrance exercises. UCFV offers an Associate of Arts degree program in Media and Communication Studies. UCFV also offers a two-year diploma program in Theatre Arts and a two-year Associate of Arts degree program with a theatre option. Both include technically oriented courses.

Four-year programs are also available. Emily Carr Institute of Art and Design offers a diploma in Fine Arts and a Bachelor of Fine Arts (BFA), with majors in photography, film/video, animation or intermedia. Admission is very competitive and is based on grades, a portfolio, a personal essay and a special project. SFU offers a BFA with options in film, theatre or visual art, and all include courses relating to technical operations. The Technical University of British Columbia offers a Bachelor of Science (Interactive Arts) degree program, which focuses on interactive computer and electronic applications that combine moving pictures or sound with graphics. The University of British Columbia, Okanagan University College and the Open University offer bachelor's programs in Fine Arts, and these allow for study in areas such as photography, scenery and costume design, and sound and lighting.

People in this field need to conceptualize ideas well and be creative, imaginative and artistic, with good interpersonal and communications skills. Attention to detail and an ability to improvise with equipment and techniques can be important. Ongoing education regarding new products, equipment and technologies is important. Comfort with computers is necessary because the introduction of laser technology and numerical photography has meant that many people in these occupations now use computers in their work. To be self-employed requires an ability to promote oneself as well as some business knowledge.

Working Conditions

The estimated average earnings for all B.C. workers in the entire occupational group were $26,700 in 1995, which is slightly less than the all-occupation average of $27,900. Approximately 75% of workers are employed full time, full year, and these workers' earnings averaged $33,100, compared to the provincial average of $39,400.

An estimated 5,800 workers were employed in these occupations in 1998, up from 4,610 in 1990. Over 47% of the workers in this occupational group are employed as *photographers* and *graphic arts technicians*, with the remaining 53% working in *technical occupations in motion pictures, broadcasting* and *the performing arts*. These technical workers are an increasing share of the occupation.

A recent graduate survey found that new workers in these occupations can earn between $1,550 per month (photographers) and $2,170 per month (support and assisting occupations in motion pictures and broadcasting). These average income earnings are based on full-time work, and some workers in this group may earn substantially more if they are in a union setting and are able to work overtime hours.

One of the unique characteristics of this entire labour force is the fact that a large proportion of its members are self-employed. Self-employment (35%) is more than double the provincial self-employed average (15%). More than half of all photographers are self-employed. According to industry sources, contract workers make up a high percentage of the work force in organizations engaged in multimedia.

In addition, the cyclical nature of work in the film industry means that a large proportion of workers are hired under contract, not as permanent employees. In fact, it is said that those working in the creative or cultural sector represent the workforce of the future, which is self-employed, entrepreneurial and highly motivated.

At 25%, the rate of part-time work is about the same as in other occupational groups. At 55%, the rate of part-year or seasonal work is higher than in other occupations. The major reason for this seasonal work is weather and location shooting. Most films are shot outdoors, so production slows down in December and picks up in March. However, industry sources state that most workers make enough money to take vacations and travel during the off-season, or they can save enough to live on when there is no work. Unemployment in these occupations is about the same as the provincial average, and the film industry in B.C. reports no current shortage of qualified workers.

Photographers work in establishments primarily engaged in portrait and commercial photography, and most graphic arts technicians work in manufacturing, printing or the advertising industry. Workers in technical occupations involved with motion pictures, broadcasting and the performing arts are employed in motion picture, radio and television production, audio and video production, as well as in theatrical and other staged entertainment services.

Most workers are located in the Lower Mainland (77%), on Vancouver Island (11%) and in the Okanagan/Kootenay (9%). There are fewer women (29%) in these occupations, and there are more workers aged 25 to 44 (66%) than in the provincial labour force in general. The average age of this group is 37, just under the average age for all occupations in B.C., which is 38.

Employment Prospects

Employment for *photographers, graphic arts technicians* and *technical occupations in motion pictures, broadcasting* and *the performing arts* is forecast to grow much faster than the all-occupation average (2.6% per year). According to the Canadian Occupational Projection System (COPS) this will result in 3,100 projected employment openings over the ten-year period to 2008. About 53% of these openings will be new jobs as a result of employment growth, and 47% will be openings due to retirements. This is a large and diverse occupational group, and growth rates among the component occupations vary widely.

According to the COPS forecast, the employment for *photographers* will grow about as fast as the average for all occupations (1.8% per year to 2008). About 630 total openings are expected, including new and replacement openings. The growing use of visual images in education, communication, entertainment, marketing, research and development should increase demand for these workers. It should be noted that commercial photography, portrait photography and photo journalism are highly competitive fields. Only the most skilled and those with the best business ability are able to attract enough work to support themselves as self-employed photographers.

Recent advances in electronic technology now make it possible for the professional photographer, using traditional cameras, to develop standard film and use flatbed scanners and photofinishing laboratories to produce computer-readable, digital images from film. Once the film has been converted to a digital image, a photographer can edit and electronically transmit the images, making it easier and faster to shoot, develop and transmit regular film pictures from remote locations.

Although most professional photographers still use silver-halide film cameras, more are using digital cameras, which use electronic memory rather than a film negative to record an image. The electronic image can be transmitted instantly via a computer modem or cable or otherwise downloaded onto a personal computer. Digital technology also allows the production of larger, more colourful, and more accurate prints or images for use in advertising, photographic art and scientific research. Because much photography now involves the use of computer technology, photographers must have hands-on knowledge of computer editing software.

Employment for *graphic arts technicians* is forecast to grow faster than average (4.6% per year). Over the next 10 years about 1,130 total openings are expected for new and replacement jobs (for information on animators, see the profile NOC 524 Creative Designers and Craftspersons). The increasing emphasis on visual appeal in advertising, marketing, television and product design should increase demand. Computer advances in multi-media and Internet use are also increasing, and these are having a major impact on both the demand for graphic arts technicians and the skills required. Despite this expected employment growth, the supply of those seeking entry to this field will probably continue to exceed requirements. Those with exceptional talent who have developed a mastery of artistic skills in addition to computer skills will have the best opportunities.

Technical Occupations: These technical occupations include film and video camera operators, broadcast technicians, audio and video recording technicians and other technical and support occupations in motion pictures, broadcasting and the performing arts (NOCs 5222, 5224, 5225, 5226 and 5227). The COPS forecast for the technical occupations in film and the performing arts shows about average employment growth (1.9% per year) to 2008. The COPS forecast is based on continued growth in B.C.'s film industry. Industry sources agree and expect that the industry will grow at the rate of 10% a year well into the next decade. It is important to remember that these technical occupations are very small in size. Despite the growth expected for the industry, total employment opportunities for all the technical occupations in film and the performing arts combined will total only about 1,400 openings to the year 2008, including new and replacement openings.

The Culture Industry: Motion pictures, broadcasting and the performing arts are parts of what is referred to as the "culture" industry. The culture sector also includes visual arts and crafts, literary arts and publishing, and museums. The general state of the economy, government policies and socio-demographic changes impact on the health of the culture industry and on career prospects in the industry.

B.C.'s reputation as an international film production centre is firmly established. It is home to numerous film and video companies and talent agencies, 70 post-production facilities and 50 shooting stages. Currently 90% of film and television production takes place in the Lower Mainland, but provincial funding has recently become available to enable more films to be produced in all regions of the province. Approximately three-quarters of total film and television production spending in B.C. is spent on foreign productions. Other factors that bring films to B.C. include the low Canadian dollar, year-round mild weather compared to Montreal and Toronto, locations that are vast, varied and widely spaced, and a time zone that is the same as Los Angeles, which makes travel and communications easy. B.C. film unions, which bargain as a collective unit, help ensure that workers are well qualified, and there is a peaceful labour climate in the province. B.C.'s well developed service infrastructure, which includes good crews and post-production studios, is also important in attracting productions. Since 1978 people locally hired on productions have increased from 40% to 97% of the average crew.

Multimedia is a new and growing segment of B.C.'s film, video and sound industries. Multimedia companies tend to be small businesses, with close to half the companies employing less than 10 people. Multimedia companies mix voice, data and images for a variety of products, such as CD-ROMs and Internet products. These are used in distance education and training, television commercials, entertainment, games and Web site development. The report "Profile of the Multimedia Industry" prepared in December 1999 for the Government of Canada indicated that finding employees who possess both the technical and the creative skills required in this industry was more difficult in 1999 than it was in 1997. A majority of those surveyed believe that the pace of growth in the Canadian market is not as fast as they had expected.

Technology: Industry experts think that technological change is mainly a positive phenomenon. They expect a redefinition of existing jobs and the creation of new ones, as well as a corresponding need to upgrade skills. With the rapid growth of the culture industry in B.C. there is a need for people trained in new technologies, including video editing, digital sound mixing and special optical effects, as well as for individuals with engineering and design skills. The industry acknowledges that opportunities for work in less skilled occupations will diminish. This may include a reduction in jobs related to traditional editing and optical effects, as well as some low-end technical jobs, as equipment becomes a more general tool of those creating or directing videos.

Technology is rapidly changing sound and lighting in the live performing arts. Technicians increasingly use computers to control their equipment. The use of fibre optics, in addition to increasing computerization, is putting some technicians out of work, as fewer of them are required to operate the new technologies. The dislocation of sound and lighting technicians is not expected to be widespread, however, because many of the sophisticated technologies available today for live performance are used primarily by commercial theatre and particularly in mega-musical productions. Small and medium-sized companies do not anticipate being able to make use of such technologies because of their high costs.

Increased automation in both audio-visual production and the live performing arts will decrease the need for lower-skilled workers in certain manual jobs, such as set moving. More computerized production of programming could also have adverse effects on job growth for audio and video recording technicians. These technicians should be familiar with advanced technology, such as digital recording, computerized data handling and control, new distribution techniques and new information media. They should also know how to use equipment based on CD-ROM technology.

In the field of audiovisual production, technological change can be expected to continue, and technicians will gradually have to adapt. Some of the major innovations are digital post-production, high or improved definition television and IMAX giant-screen technology. The trend is toward employment of audiovisual technicians with computer skills in sound editing and design as well as in digital imaging from film. In the future, audiovisual technicians will have to be able to use the technology creatively in order to meet the industry's need to offset high production costs. For example, altering real images with computers makes it possible to use the images in various programs and reduce production costs at the same time.

In television, computerized production of programming is increasing every year, especially in technical maintenance and transmission technology. Knowledge of software programs and computerized production systems is an asset for television broadcast technicians.

In radio broadcasting, the development of digital transmission and other technological innovations, such as mixing, digital memory and "pre-programmed radio," mean radio broadcast technicians must now acquire a general knowledge of the overall system rather than only the component parts for which they are individually responsible. The use of consoles and music transmission systems by advertisers is expected to diminish job opportunities for technicians. The broadcasting of programs in automatic mode, especially at night, could also reduce the number of operators. New technologies are affecting employment in many ways and make upgraded technical and computer skills a vital requirement for radio broadcast technicians.

Public Policies: In addition to government funding, government regulations can dramatically influence the culture sector's potential by requiring minimum Canadian content (for example, radio and television) or by offering preferential tax treatment. The development of Canadian independent audio-visual productions has been affected by restraint in federal and provincial spending. B.C. offers two new tax credit programs for domestic and foreign film production, and these offer film makers refundable corporate income tax credits. This should help B.C. attract more production in the long run. On the other hand, some government officials feel that highly paid foreign actors who work in Canada should pay Canadian income tax on their earnings. If this policy were to be adopted, it may discourage some well-known stars from working in Canada and reduce the attractiveness of B.C. as a production site.

General State of the Economy: Increased prices and economic insecurity have reduced audiences for most out-of-home entertainment. The rate of growth in the B.C. cultural industry has flattened in recent years. Limited growth in disposable incomes is changing markets for leisure significantly.

Social and Population Changes: Socio-demographic trends affect the demand for goods and services, including demand for cultural products. For example, a relatively highly educated, well-off "baby boomer" entering middle age with children gone is expected to present a marketing opportunity for the live performing arts. At the same time this group also wants home entertainment, such as single topic television channels, movies by cable, purchased movies and videos, and Internet-based entertainment.

Another demographic trend is the increasing ethnic diversity in our population. This is expected to place further pressure on the cultural sector for productions that reflect creative input from the various cultural groups that make up Canadian society. For example, there is increasing demand for cable TV and radio services in different languages. These productions will, in turn, offer opportunities to those who can provide such products.

Globalization: As the economies of all countries become increasingly interconnected in one global market and one global labour pool, the cultural sector is facing increased competitive pressure. This will mean that demand for multi-disciplinary workers will continue to rise. In addition to developing advanced creative skills, those interested in working in these occupations should develop expertise in marketing, contracts, negotiations and rights, and micro business skills.

Career Entry: Industry sources consider networking to be the most valuable tool for successful transition from education to the labour force. Some aspiring entrants into the film industry have unrealistically high expectations about the types of entry-level positions that will be available to them. Industry sources suggest that having realistic expectations helps aspirants to cope more effectively with transition. Good skills in résumé writing, job search techniques, career planning and management will help students enter the industry. Having good work skills, people skills and a professional work ethic are keys to surviving in the industry. With regard to ongoing training, industry sources remind those who are interested in this work that the industry has built-in training based on initiative and assertiveness.

Recruitment methods for film industry occupations for most positions depend on the union/non-union status of the production. If the production is non-union, hiring is done through the production managers who bring in people they know and have worked with before. If it is a union production, hiring is done through the union hall. The union presents the producers with a list of who is qualified and available for the job. Marketing yourself well will be important in either a union or a non-union setting.

Additional Information

"Profile of the Multimedia Industry"
http://strategis.ic.gc.ca/SSG/it05386e.html

Getting Into: The A.C.T!
http://www.artsjobs.bc.ca/welcome.html

B.C. Film Commission *http://www.bcfilmcommission.com*

Canadian Association of Broadcasters
http://www.cab-acr.ca

Canadian Film and Television Production Association
http://www.cftpa.ca
http://www.ted.cftpa.ca

For more information on computer-related occupations, see the *Information Technology Occupations* section in the *Introduction to Work Futures*.

Related Occupations

- filmmakers and directors of photography (in 513 creative and performing artists)
- video artists (in 513 creative and performing artists)
- correspondence, publication and related clerks (in 145 library, correspondence and related information clerks)
- graphic designers and illustrating artists (in 524 creative designers and craftspersons)
- desktop publishing specialists (in 142 office equipment operators)
- graphic arts camera operators (in 947 printing machine operators and related occupations)
- film editors (in 513 creative and performing artists)
- lighting designers (in 524 creative designers and craftspersons)

Announcers and Other Performers

NOC 523

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	1,740	1,560	1,560

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
0	360	360

Annual Growth 1998-2008

Main Industries of Employment

Radio and TV Communications	33%
Amusement and Recreation Services	23%
Other Service Industries	13%

Employment by Region

Lower Mainland	62%
Vancouver Island	15%
Northern B.C.	10%
Okanagan/Kootenay	13%

Self-employment 24%

Nature of the Work

Announcers and *other broadcasters* read news, sports, weather and commercial messages, and they host entertainment and information programs for broadcast on radio or television. They are primarily employed by radio and television stations and networks and by commercial firms that produce advertisements for radio or television.

This occupational group also includes magicians, fashion models, puppeteers and other performers not elsewhere classified. They are employed by nightclubs, theatre, advertising and other production companies, or they may be self-employed.

Main Duties

People in this group work for radio and television stations and networks, circuses and nightclubs, and for theatre, advertising and other production companies. They may also be self-employed.

Announcers and *other broadcasters* read the news, sports, weather and commercial messages, and host entertainment and information programs for broadcast on radio or television. They may specialize in areas such as news, sports, weather or traffic reporting, and present their own material or material prepared by others.

Buskers entertain passers-by on sidewalks, malls and other areas with magic tricks, juggling acts, short dramatic works and other entertainment activities.

Magicians and *illusionists* perform sleight-of-hand and other tricks to entertain audiences.

Models display clothing and other merchandise in commercials, advertisements and fashion shows. They also pose for photographers and artists.

Puppeteers operate puppets and marionettes.

This occupational group also includes disk jockeys, radio hosts/hostesses, talk show hosts/hostesses, traffic and weather reporters, acrobats and ventriloquists.

Example Titles

announcers and other broadcasters (5231):

- traffic reporter
- weather reporter
- television host/hostess
- radio host/hostess
- talk show host/hostess
- news reader
- announcer
- sports announcer
- broadcaster
- disk jockey

other performers (5232):

- busker
- ventriloquist
- clown
- magician
- puppeteer
- model
- acrobat
- circus performer

Education and Training

The basic prerequisite for entry into most of these occupations is graduation from a two-year college program or completion of a bachelor's degree in a relevant field of study. As well, employers may provide on-the-job training. Volunteer work at television and radio stations, for example, at university and community stations, can enhance credentials.

Self-study is generally necessary for entertainers included in this occupational group.

The British Columbia Institute of Technology offers a two-year Broadcast Communications program, with options in radio, television and broadcast journalism. Completion of grade 12, proof of basic computer literacy, keyboard skills of 25 wpm, submission of an essay on career goals and letters of reference are required for admission. Langara College has a journalism program, which is print-oriented but offers sufficient opportunity for developing broadcasting and reporting skills. This program grants a two-year diploma or a one-year certificate to students with a relevant university degree.

To be successful in this highly competitive area it is necessary to have a good command of language and a pleasant-sounding, clear voice. For sports announcing, a thorough knowledge of sports is required. Good communication and analytical skills, knowledge of computers and an ability to deal with change are important. High school courses in English, drama, foreign languages, plus participation in sports and music hobbies (including vocal lessons) can provide valuable background. A willingness to continue acquiring new skills is important to success. Management skills may also be helpful.

Working Conditions

In 1995 the average annual earnings for all workers in this occupational group were $22,800, with those who worked full time for the full year earning $40,500 on average. The respective all-occupation averages were $27,900 and $39,400.

The number of employed workers in 1998 is estimated at 1,560, down slightly from 1,740 in 1990. The decline in employment occurred in both the *announcers* and *other broadcasters* category and in the *performers* category. About two-thirds of the entire group are announcers and other broadcasters, while the rest are performers.

A recent graduate survey found that new workers in the announcers and other broadcasters category earned on average $1,610 per month, based on full-time work. This occupation is not expected to grow significantly over the next few years. It is anticipated that most openings for new entrants will be the result of attrition as other workers leave the occupation or retire.

Self-employment stands at 24% for the entire group but is recorded at 34% for performers. By comparison, the rate of self-employment across all occupations in B.C. is 15%. Part-time employment is higher than the all-occupation rate of 26%, with 47% of the entire group and 59% of performers working part time. Unemployment for the entire group is the same as the all-occupation average but is lower for announcers and other broadcasters and slightly higher for performers. About 58% of the entire group work for only part of the year, but this is the case for 84% of performers.

About 33% of this occupational group work in radio or television, about 23% are employed in amusement and recreational services, and about 13% can be found in other service industries.

Regional distribution for the entire group is close to the all-occupation average, with 62% located in the Lower Mainland, 15% on Vancouver Island, 13% in the Okanagan/Kootenay and 10% in Northern B.C. Performers are concentrated in the southwest corner of the province, with 70% in the Lower Mainland and 19% on Vancouver Island.

Women account for 44% of the entire group, close to the all-occupation average of 46%. However, within the two groups, women make up 73% of performers and only 25% of announcers and other broadcasters.

This occupational group tends to be young, as representation in the 15 to 24 (26%) and 25 to 34 (39%) age groups is substantially higher than the all-occupation averages. This concentration of younger workers is also reflected in the average age for this group (33), compared to the all-occupation average for B.C., which is 38 years of age.

Employment Prospects

This occupational group is expected to experience little change in the number of people employed. The Canadian Occupational Projection System (COPS) projects that there will be 350 net employment openings to the year 2008, almost all of these to replace those who retire. Competition for opportunities will be very strong because these fields typically attract many more job seekers than there are openings.

Two-thirds of those workers are *announcers* and *broadcasters*. Increasing consolidation of radio and television stations, new technology, and the growth of alternative media sources, such as the Internet, will contribute to the decline in employment for announcers.

The *other performers* group, which includes buskers, magicians and models, will fare a little better. COPS projects average growth and a total of 210 openings over this period.

There is less funding for public television, and programming that was once produced in-house will in future be contracted out to private production houses. Cutbacks to the CBC have decreased the demand for announcers and program hosts. Limited new job openings for announcers and other broadcasters will result from the growth in the number of cable television systems and the licensing of new radio and television stations. The Canadian radio and television broadcasting industry will continue to adapt to changes that are having a major effect on staffing levels and the skills required of employees.

In addition to the journalistic and presentation skills already required in the radio and television industry, new technologies require employees to upgrade their technical and computer skills. Candidates for jobs as announcers or broadcasters will require more comprehensive skills. For example, local announcers are now using consoles and music transmission systems, which reduce the need for technicians and make it possible for one person to produce a show when two or three were previously needed.

Small radio stations are more inclined than larger stations to hire beginners or interns. Because competition for ratings is intense, large stations will continue to seek announcers who have proven that they can attract and retain a large audience. Newscasters who are knowledgeable in such areas as business and health, where consumer interest is high and specialized knowledge is important, may have an advantage over others in obtaining contracts.

The other performers group is one that often provides part-time employment to those who have particular talents, such as puppetry or mime, and can market themselves to perform for recreational events. There are very limited opportunities for modelling in B.C.

Additional Information

StudyWeb *http://www.studyweb.com/links/4740.html*

Alliance of Canadian Cinema, Television and Radio Artists (ACTRA) *http://www.actra.com*

Canadian Association of Broadcasters
http://www.cab-acr.ca

Broadcaster Magazine
http://www.broadcastermagazine.com

Canadian Film and Television Production Association
http://www.cftpa.ca
http://www.ted.cftpa.ca

Communications, Energy and Paperworkers Union of Canada (CEP) *http://www.cep.ca*

Related Occupations

- broadcast journalists who prepare and present their own reports (in 512 writing, translating and public relations professionals)
- support and assisting occupations in motion pictures, broadcasting and the performing arts (in 522 photographers, graphic arts technicians and technical occupations in motions pictures, broadcasting and the performing arts)
- actors (in 513 creative and performing artists)
- dancers (in 513 creative and performing artists)
- musicians and singers (in 513 creative and performing artists)

Small radio stations are more inclined than larger stations to hire beginners or interns.

Creative Designers and Craftspersons

NOC 524

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	8,040	11,860	16,160

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
4,300	1,690	5,990

Annual Growth 1998-2008 3.1%

Main Industries of Employment

Advertising Services	18%
Retail Trade	15%
Other Business Services	13%

Employment by Region

Lower Mainland	65%
Vancouver Island	19%
Northern B.C.	5%
Okanagan/Kootenay	12%

Self-employment 51%

Nature of the Work

This occupational group includes a variety of designers and craftspersons who use their creative abilities to develop designs, crafts or patterns.

Graphic designers and *illustrating artists* conceptualize and produce designs, illustrations, layouts and visual images to communicate information for publications, advertising, films, posters and signs. They are employed by advertising and graphic design firms and by other establishments with advertising departments. Graphic designers and illustrating artists who are also supervisors, project managers or consultants are included in this group.

Interior designers enhance the function and quality of interior spaces in order to increase productivity, improve the quality of life and protect the health, safety and welfare of the public. They are employed by architectural firms, interior design firms, retail establishments, construction companies and other establishments, or they may be self-employed.

Other designers in this group include those who conceptualize and produce designs for film, television, theatre and video productions, garments and textiles, displays and exhibits and other creative items, such as jewellery, toys and trophies. Theatre designers are employed by performing arts and broadcasting companies, fashion designers are employed by clothing and textiles companies, and exhibit designers are employed by museums and retail establishments. Other creative designers are employed by manufacturing establishments, or they may be self-employed.

This group also includes *artisans* and *craftspersons* who use manual and artistic skills to design and make ornamental objects, pottery, stained glass, jewellery, rugs, blankets and other handicrafts, as well as including makers of stringed musical instruments. Most of these artisans and craftspersons are self-employed. Craft instructors are also included in this group and are employed by artisan guilds, colleges, private studios and recreational organizations.

Patternmakers create master patterns for the production of garments, footwear and other textile, leather or fur products. They are employed by textile, leather or fur products manufacturers, or they may be self-employed.

©Stone/Vancouver

Main Duties

Graphic designers and *illustrating artists* consult with clients and determine the medium best suited to produce desired visual effect and method of reproduction, and they prepare sketches, photographs or illustrations of subjects to be rendered. They also estimate cost of materials and time to complete graphic design and illustration, prepare specifications for design and produce final designs or illustrations, or they supervise the production of design by other graphic designers or graphic arts technicians.

Interior designers consult with clients to determine needs, preferences and safety requirements, formulate preliminary design concepts, develop and present final design recommendations, and prepare working drawings and specifications for non-load-bearing interior construction, materials, finishes, space planning, furnishings, fixtures and equipment. They also collaborate with professional services of other licensed practitioners in technical areas of mechanical or electrical design. They prepare and administer bids and contract documents, and they review and evaluate design solutions during implementation and upon completion.

Theatre designers design sets, costumes and lighting for theatre, film and video productions, operas and ballets.

Fashion designers design and create clothing and accessories.

Exhibit designers plan and develop exhibits and displays for museum exhibitions, trade shows, conventions, retail spaces and other purposes.

Carvers use hand tools and woodworking machines to produce carvings from wood, stone and other materials and to carve ornamental designs into wooden furniture and other objects.

Glass blowers design and create glass objects using blowpipes and artisan's hand tools and equipment.

Metal arts workers design jewellery, utensils, implements, wall hangings, and other objects and crafts from gold, silver, copper, pewter and other metals.

Potters design and create ornamental and functional earthenware pieces by shaping clay using moulds or a potter's wheel. They glaze pieces and fire them in a kiln.

Stained glass artists cut, paint, fire and assemble pieces of stained glass for windows, lampshades and other objects.

Stringed instrument makers construct stringed instruments using hand and power tools and applying knowledge of wood properties and instrument design.

Weavers use their hands or a loom to make baskets, wreaths, wall hangings, clothing, rugs, blankets and other objects.

Craft instructors prepare craftmaking lessons, gather the required working materials, and demonstrate and teach craftmaking techniques.

Patternmakers examine sketches, samples of articles and specifications of designs to determine number, size and shape of pattern parts, and amount of cloth required to make products. They draw, lay out and cut the master pattern of a product, outline parts of the pattern on paper and mark the pattern to indicate details. They also create pattern size variations from a master pattern using a computer or drafting instruments or forward patterns to a computer operator to create pattern size variations. They lay out master patterns on fabric and cut sample patterns, and they mark size, identification, style and other information on sample patterns.

Example Titles

graphic designers and illustrating artists (5241):

- illustrator
- title artist
- commercial artist
- medical illustrator
- scientific illustrator
- layout designer
- page designer
- apprentice graphic arts, artist (mechanical and creative)
- graphic artist
- advertising designer
- animator

- art director
- web designer

interior designers (5242):
- interior design technician
- office space planner
- building space planner
- kitchen designer
- project manager, interior design
- retail space planner

theatre, fashion, exhibit and other creative designers (5243):
- window display designer
- lighting designer
- set designer
- fur designer
- shoe designer
- clothing designer
- fashion designer
- jewellery designer
- fabric designer
- costume designer
- toy designer
- museum exhibit designer
- trophy designer
- couturier

artisans and craftspersons (5244):
- carver
- metal arts worker
- stained glass artist
- potter
- apprentice master glass blower
- glass blower
- stringed instrument maker
- silversmith
- craft instructor
- totem pole carver
- leather worker
- weaver

patternmakers - textile, leather and fur products (5245):
- textile products patternmaker
- leather products patternmaker
- embroidery patternmaker
- shoe patternmaker
- dress patternmaker
- fur garments patternmaker

Education and Training

Graphic designers, illustrating artists and *interior designers* usually complete grade 12 and a college or university program in graphic arts, commercial arts or photography, interior design or visual arts, with specialization in one of these areas. Experience as a graphic arts technician may substitute for post secondary training. Submission of a portfolio of work is usually requested by art schools and prospective employers to show evidence of creative ability. An ability to conceptualize visually is vital, and typographic and computer skills may be required. Continuing education is usually necessary.

Many design programs are available in B.C. at colleges and universities. Certificate programs in applied, visual and/or graphic design are available at Capilano College, Northern Lights College, Kwantlen University College and Vancouver Community College and are normally completed in one year. These programs provide a basic foundation in design, drawing and illustration. Two-year graphic arts and design diploma programs are available at Capilano College, Langara College, University College of the Cariboo, Kwantlen University College, Malaspina University College, University College of the Fraser Valley and Emily Carr Institute of Art and Design.

These programs provide many of the technical skills needed to work as a graphic designer or illustrator, including an introduction to a variety of audio-visual applications and business skills. Langara College offers a Display and Design diploma, which emphasizes visual merchandising and business as it relates to art. Admission to these programs generally requires completion of grade 12 and submission of a portfolio that demonstrates skills in design and drawing.

In addition, many colleges in B.C. also offer two-year diploma programs in fine arts/visual arts, which encourage students to explore a broad range of concepts, materials, techniques and processes. These programs assist students in developing personal interests, directions and creative maturity, as well as in preparing high-quality portfolios that can be used to gain acceptance to advanced art and design programs or to gain employment.

Fine arts diploma programs are available at Camosun College, Capilano College, Northern Lights College, North Island College, Langara College, Nicola Valley Institute of Technology, Emily Carr Institute of Art and Design (ECIAD) and at all public university colleges in B.C. See the profile Creative and Performing Artists (513) for more details. Admission requirements generally include grade 12, submission of a portfolio of recent works and an essay about career goals. Many programs, or courses within the programs, are eligible for university transfer credit into degree programs in fine arts or education.

Study in commercial animation is possible at Capilano College. Graduates of this two-year program can find work as animation artists and designers for television, film and computer game productions. Applicants must have completed secondary school and must submit a portfolio of work. Emily Carr Institute of Art and Design offers a Bachelor's degree program in Media Arts with an option to major in animation. Graduates are equipped to work in animation as it is applied to entertainment, advertising, communication and the independent production of fine art film.

Malaspina University College offers a two-year applied art diploma with an interior design focus. This program provides students with knowledge and skills needed for a career in interior design. Kwantlen University College offers a four-year bachelor's degree in Applied Design (Interior Design). British Columbia Institute of Technology offers certificates in interior design. The Management Certificate in Interior Design is designed for those seeking employment in the interior design field, while the Senior Certificate in Interior Design is for those who want a higher level of certification.

Completion of a four-year degree and two years of related work experience, or completion of a diploma and four years of work experience, qualifies graduates to write the National Council for Interior Design Qualification (NCIDQ) examination. Those who pass the exam can assume the professional designation of Registered Interior Designer and are registered as professional members of the Interior Designers Institute of B.C. as well as of the Interior Designers of Canada. To remain competitive in their field, interior designers are expected to study continually and to learn new skills.

Kwantlen University College offers a four-year Bachelor of Applied Design in Fashion Design and Technology. It is currently the only applied fashion design degree in Western Canada. This degree provides an integrated study of design, production and marketing concepts. Admission requirements include English 12 (or equivalent) as well as fashion skills and presentation of a portfolio at an interview.

The School of Design at ECIAD also offers four-year bachelor's degree programs in design, majoring in communication design or industrial design. Prospective students must have grade 12 or equivalent. Admission to the full-time program is very competitive and is based on grades, assessment of a portfolio, a personal essay, a special project and the individual's suitability for the program. An interview may be required.

Theatre, fashion, exhibit and other creative designers usually complete a college or art school program in theatre design, clothing design or exhibit design, or a bachelor's degree in fine arts or visual arts with specialization in these areas. Fashion designers are usually required to undergo training under the supervision of an experienced designer as well. Communication skills are important, as is a general knowledge of business, marketing, merchandising and promotions. Comfort with computers and research and market analysis skills are important.

Kwantlen University College and University College of the Fraser Valley offer two-year diploma programs in fashion design, which allow development of the skills necessary to convert an original idea into a marketable design and then convert it into a finished garment. Creativity and technical skills are stressed. Grade 12 with English and mathematics skills, good sewing skills and submission of a portfolio demonstrating design and drawing ability are required.

Kwantlen University College also offers a one-year Fashion Marketing certificate, which may be taken before, in conjunction with, or upon completion of, a fashion design program. This program introduces skills needed in buying, selling and promoting fashion and fashion-related products at the wholesale and retail levels.

Capilano College offers a two-year, full-time diploma program in Textile Arts, which emphasizes weaving, surface design, textile history, design and drawing.

Several institutions offer a bachelor's degree useful to people working in this field. Undergraduate degrees in fine arts/visual arts are available at Emily Carr Institute of Art and Design, Malaspina University College, Okanagan University College, Simon Fraser University, the University of British Columbia (UBC), the University of Victoria (UVic) and through the Open University. In addition, UBC offers a bachelor's degree in Home Economics, which incorporates a study of textile design, history and economics. Admission to these programs generally requires completion of grade 12 and, in some cases, submission of a portfolio. Undergraduate degree programs in design/applied design are also available at Kwantlen University College, ECIAD as well as through the Open University.

UVic offers a master's degree in fine arts, specializing in design and production, within its theatre graduate program. Admission requires an undergraduate degree with completion of appropriate undergraduate theatre courses. Experience in theatre with lighting, costume and scene design is an asset. UBC offers a masters degree in art history, and SFU offers an interdisciplinary Masters of Fine Arts program, which involves advanced studies in visual arts, music, dance, theatre and film.

Artisans and *craftspersons* often learn their skills by taking a number of non-credit courses offered by recreation and community organizations, schools and colleges. In some communities, training is offered by artisan guilds and private studios. Vancouver Community College offers a Jewellery Art and Design diploma. In addition, several college diploma programs in visual arts provide an opportunity to explore various mediums. See Creative and Performing Artists (513) for more details.

Working Conditions

Workers in this occupational group usually work in well-lit, well-ventilated art and design studios located in office buildings or their own homes. Some creative designers and craftspersons work in areas or facilities that can be crowded.

Most of the workers in this group who are employed by design firms, manufacturing companies or other such establishments have conventional work schedules. However, creative designers in television production are an exception as their work hours can be long and irregular and the pace of work can be very fast. For nearly all creative designers and patternmakers, overtime can be expected for special projects or at certain times of the year.

Those who are self-employed tend to work longer hours, especially when they are trying to establish themselves and cannot afford to hire assistants or clerical staff. They may have to adjust their work hours to accommodate their clients by meeting with them in the evenings or on weekends.

Craftspersons and *artisans* are often self-employed. They work in private studios or in their own homes, and except for special projects, they generally maintain a flexible work schedule.

In 1995 the average annual earnings for all workers in this occupational group were $20,500, with the 43% who worked full time for the full year receiving an average of $28,700 in earnings. Earnings were lowest for artisans and craftspersons ($11,300 for all, $18,000 for full time, full year). Earnings were highest for *graphic designers* and *illustrating artists* ($25,400 for all, and $31,800 full time, full year) and *interior designers* ($24,700 for all, and $34,100 full time, full year). *Patternmakers', theatre, fashion* and *exhibit* and *other creative designers'* earnings were between the averages of the two groups above. The respective all-occupation averages in the province in 1995 were $27,900 and $39,400.

Industry sources suggest that entry-level wages for those in the apparel industry can range from $16,000 to $20,000 for full-time, full-year work. Experienced workers can earn an average of $25,000 to $45,000 full time, full year, while management earnings may be even higher. According to the apparel industry, more than 7,000 workers were employed in this occupation in 1998. Opportunities in the apparel industry exist for graduates with a background in design, business, textiles, patternmaking, computers and a number of other specialties.

A recent graduate survey found that entry-level graphic designers and illustrating artists earned an average $2,170 per month ($26,100 per year) based on full-time work. New interior designers earned slightly less ($2,040 a month for full-time work), and theatre, fashion, exhibit and other creative designers could expect an average of $1,770 a month for full-time work.

This is a very large occupation group. The number of employed workers rose from 8,040 in 1990 to 11,860 in 1998. About 54% are graphic designers or illustrating artists, 27% are artisans and craftspersons, 10% are interior designers, and about 7% are theatre, fashion, exhibit and other creative designers. The rest are patternmakers of textiles, leather or fur.

Self-employment for artisans and craftspersons is very high (69%), compared to the 15% all-occupation average. On the other hand, self-employment for patternmakers is lower (9%) than the average. About 32% of these workers are employed part time, and about 48% work for only part of the year.

Workers in this group can be found in a very wide range of industries with the largest concentrations employed in advertising services (18%), retail trade (15%) and business services (13%). Telecommunications, printing and publishing, and manufacturing account for most of the remaining workers in this occupational group. Roughly two-thirds of these workers are located in the Lower Mainland. Vancouver Island is home to 19% of these workers, and 12% are in the Okanagan/Kootenay.

Women make up 54% of this entire group, but their representation is smaller among graphic designers and illustrating artists (44%) and higher among interior designers (71%). The age distribution of the group is fairly close to the all-occupation average, although the proportion of those aged 15 to 24 is somewhat lower, and the proportion of those in the 25 to 34 age group is somewhat higher.

Employment Prospects

The Canadian Occupational Projections System (COPS) forecasts employment growth for *creative designers* and *craftspersons* that is much faster than the all-occupation average. A growth rate of 3.1% per year is forecast over the ten-year period to 2008. A total of 5,990 employment openings are expected. About 72% of these openings will be new jobs, and 28% will be openings to replace those due to retire. This occupational group includes many specialties that can expect quite different growth patterns. For example, the employment growth rate for graphic designers and illustrating artists is much higher than that for interior designers.

Graphic designers and *illustrating artists* make up over half of this occupational group. COPS forecasts a much faster than average growth. There will be an estimated 4,120 employment openings to the year 2008, with 76% being new jobs, and 24% being replacement openings for those due to retire. Demand for the work of graphic designers and illustrating artists will be strong as producers of information, goods and services put even more emphasis on visual appeal in product design, advertising, marketing and television. The growth for graphic designers may be somewhat reduced by the increased use of computer-aided design systems that can be operated by other employees without formal design training. While most workers in this occupational group are in graphic design firms, ad agencies and "in house" departments in corporations, there are a growing number of individuals who work freelance. A self-employed graphic designer needs a computer, appropriate software, and access to artists and photographers. The Internet has provided tremendous opportunities for those wishing to enter this specialization. Despite the expected employment growth, however, the supply of those seeking entry to this field will continue to exceed requirements. Those with computer and entrepreneurial skills in addition to outstanding talent, creativity and style will have the advantage.

The specific skills required of *animators* are different from those required of graphic designers and illustrating artists, although animators are included in the same occupational group. Canada has developed a strong reputation at home and abroad for high-quality products and skilled practitioners in classical (pencil drawing) animation and in computer animation. Canadian computer animators have led the way in writing complex computer code that enables computer modellers to emulate real-world images with tremendous fidelity.

While most Canadian animators have traditionally moved to the United States or overseas to obtain work in this field, the number of employment opportunities is growing at home. Pre-production work, such as the development of storyboards, layouts and character design for animated productions, is done increasingly in B.C. Lower Mainland-based companies are also providing a growing market for computer animation for video games.

A large production company recently closed its studio in Vancouver, creating a surplus of animators. Industry sources expect that these animators will be absorbed by smaller studios where much of the available animation work in B.C. is done. A large segment of the multimedia industry in this province is made up of smaller companies (in B.C., an average size of 23 employees). Most of the available work is contract-based.

Despite a positive outlook for animation, the labour market is competitive even for qualified individuals. Completion of a highly-regarded animation instruction program enhances an animator's chances for work, but acceptance into such programs is also very competitive. Programs are offered at such institutions as Sheridan College in Ontario, the Emily Carr Institute of Art and Design and Capilano College. Any individual giving serious consideration to entering this field must be not only talented but also persistent and dedicated.

COPS forecasts the employment for interior designers to grow about the same as the all-occupation average. There will be a total of 360 openings to 2008, including new and replacement openings. The number of individuals wanting to enter this field is expected to be greater than the number of employment opportunities, and as a result, competition for work will be intense.

Those interior designers who can develop some form of working alliance or partnership with architects or other professionals involved in construction or design will increase their opportunities for work. Work prospects will be best for those who have strong business and technical skills in computer use, communication and marketing.

The COPS forecast for theatre, fashion, exhibit and other creative designers calls for employment to grow faster than average. Because this is a small group there will be only 310 openings to the year 2008, including new and replacement openings. The supply of individuals seeking entry into this field is expected to surpass the number of employment opportunities. People seeking work in these creative design fields need to focus on the business aspects of the industry, especially with regard to marketing and promotion.

Artisans and *craftspersons* are forecast to experience faster than average growth in employment. A total of 1,150 openings are expected over the projection period, with 63% the result of new job growth. Employment as an artisan or craftsperson is highly sensitive to general economic conditions. Many workers are self-employed and work out of their homes. They sell their products through retail outlets, trade shows and fairs or through their own studio retail outlets. Marketing is an important part of their job, and many artisans are becoming more involved in export markets. The Internet has made this easier, but there are still challenges with customs and taxation when it comes to delivering products to customers who do not live in Canada.

Patternmakers make up a very small group in B.C. It is projected that there will be slower than average growth for this group, and only 50 openings are projected between 1998 and 2008. One reason for the slow growth anticipated for patternmaking occupations is the strong foreign competition in the garment industry.

Workers in all these occupations can expect to face strong competition throughout their careers. Because of the abundant supply of talented individuals who are attracted to these careers, those without additional skills, such as communication skills, business sense, adaptability and persistence, are likely to find it very difficult to establish and maintain a career in these creative fields.

Additional Information

Design Access http://www.designaccessbc.com

Design Source http://www.designsource.bc.ca

For *interior designers*
Interior Designers of B.C. http://www.idibc.bc.ca

For *patternmakers*
Apparel B.C. Association http://www.apparel-bc.org

For more information on computer-related occupations, see the *Information Technology Occupations* section in the *Introduction to Work Futures.*

Related Occupations

graphic designers and illustrating artists (5241):

- graphic arts technicians (in 522 photographers, graphic arts technicians and tech occupations in motion pictures, broadcasting)
- painters, sculptors and other visual artists (in 513 creative and performing artists)
- advertising managers (in 01/09 middle and other management)

interior designers (5242):

- industrial designers (in 225 technical occupations in architecture, drafting, surveying and mapping)
- interior decorators (in 6421 retail salespersons and sales clerks)

theatre, fashion, exhibit and other creative designers (5243):

- industrial designers (in 225 technical occupations in architecture, drafting, surveying and mapping)
- diorama maker - museums and galleries (in 521 technical occupations in libraries, archives, museums and galleries)

artisans and craftspersons (5244):

- jewellers, watch repairers and related occupations (in 734 upholsterers, tailors, shoe repairers, jewellers and related)
- painters, sculptors and other visual artists (in 513 creative and performing artists)

- fabric-making occupations in manufacturing (in 944 machine operators and related workers in textile processing)

Athletes, Coaches, Referees and Related Occupations

NOC 525

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	6,180	8,330	10,520

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
2,190	1,100	3,290

Annual Growth 1998-2008	2.4%
Main Industries of Employment	
Amusement and Recreation Services	56%
Personal and Household Services	12%
Local and Other Administration	8%
Employment by Region	
Lower Mainland	56%
Vancouver Island	21%
Northern B.C.	7%
Okanagan/Kootenay	17%
Self-employment	15%

5

Nature of the Work

Athletes participate in competitive sports events as amateurs or professionals. They play team sports, such as hockey, baseball, football and lacrosse, or they compete in individual sports, such as skiing, figure skating, boxing or track and field. Athletes are employed by professional team organizations, or they may be self-employed.

Coaches prepare and train individual athletes or teams for competitive events. They are employed by national and provincial sports organizations, professional and amateur sports teams, sports clubs and universities, or they may be self-employed. This group also includes sports scouts who identify and recruit athletes for professional sports teams. These scouts are employed by professional sports organizations.

Sports officials and *referees* observe and enforce rules and regulations governing sporting events, athletic games and sports competitions. They are employed by national, provincial and local sporting commissions, organizations and leagues.

Program leaders and *instructors* in recreation and sport lead and instruct groups and individuals in recreational, sports, fitness or athletic programs. They are employed by community centres, sports and fitness clubs and similar establishments.

Main Duties

People in this group work for professional team organizations, amateur sports teams, sporting commissions, organizations and leagues, community centres, universities, sports and fitness clubs, and similar facilities. They may also be self-employed.

Athletes participate in competitive sports events on an amateur or professional basis. They play team sports, such as hockey, baseball and football, or compete in individual sports, such as figure skating, track and field and boxing.

Coaches prepare and train individual athletes and teams for competitive events.

Sports scouts identify and recruit athletes for professional sports teams.

Sports officials and *referees* observe and enforce rules governing sporting events, athletic games and sports competitions.

Program leaders and *instructors* in recreation and sport plan and coordinate recreational, sports, fitness and athletic programs for individuals and groups.

©Stone/Vancouver

Example Titles

athletes (5251):

- golfer
- sprinter
- harness race driver
- figure skater
- skier
- jockey
- track athlete
- baseball player
- boxer
- football player
- hockey player
- professional athlete

coaches (5252):

- gymnastics coach
- hockey coach
- national team coach
- head coach
- athletics coach
- football coach
- football scout
- hockey scout
- figure skating coach
- sports scout
- swimming coach
- volleyball coach

sports officials and referees (5253):

- athletic judge
- figure skating judge
- goal judge
- umpire
- harness racing starter
- clerk-of-the-course
- linesman/woman, sports
- paddock judge
- racetrack timer

program leaders and instructors in recreation and sport (5254):

- aerobics instructor
- fitness instructor
- swimming instructor
- golf professional
- ski instructor
- riding instructor
- animator, recreation and sport
- recreation program leader
- fitness leader
- playground worker
- lifeguard
- ski patroller
- camp counsellor
- arts and crafts leader

Education and Training

Athletes require demonstrated ability in a particular sport and extensive training under the supervision of a coach. Certification with a particular sports federation may be required.

In addition to several years' experience in a particular sport, employment as a *coach* usually requires at least completion of grade 12 and a bachelor's degree in Physical Education or Kinesiology. Trainers and instructors at post secondary institutions may be required to have a master's degree.

In addition, completion of the National Coaching Certificate Program is usually necessary. Level 3 in the program is usually required to work as a provincial coach, and Level 4 is usually required by those who coach national athletes.

Volunteer coaches of amateur teams may be required to achieve certification at coaching clinics.

Program leaders and *instructors* in recreation and sports usually require completion of secondary school and a college program in recreation or physical education, or extensive experience in a specific recreational or sports activity. Certification is usually required in the specific area.

Sports officials and *referees* require certification by and registration with a sports governing agency or commission. Referees require completion of an officiating program offered by a governing agency.

The University of British Columbia (UBC), Simon Fraser University (SFU) and the University of Victoria (UVic) offer four-year bachelor's degree programs in Human Kinesiology/Kinesiology. UBC offers a master's degree in Human Kinetics, and SFU offers a master's degree in Kinesiology. UVic's Department of Education offers a master's degree in Arts (Physical Education) and Arts (Sport and Exercise Studies) and a master's degree in Education (Coaching Studies) and Education (Physical Education).

SFU offers a part-time certificate program in Health and Fitness Studies for uncertified sports coaches. Douglas College and Langara College both offer two-year coaching diplomas that prepare students for careers in coaching or can be applied toward a related degree in this field.

B.C. colleges and university colleges offer a variety of courses in this area that are eligible for credit upon transfer into degree programs at public universities. Many offer shorter-term certificate and diploma programs as well. Camosun College has a ten-month Recreation Leadership program. Applicants require grade 12 or equivalent, demonstrable swimming ability, a cardiopulmonary resuscitation certificate and proven good medical health.

Langara College also offers a two-year diploma in Recreation Leadership, as well as a one-year Recreation Leadership Post-Diploma program. Prerequisites for the diploma program include grade 12 or equivalent, letters of reference, physical and emotional health, and evidence of previous participation in sports and recreation. Those applying for the post-diploma program should have completed the Langara Recreation Leadership program or an equivalent.

College of the Rockies offers a one-year certificate and a two-year diploma in Leisure and Recreation Services Management. Applicants require grade 12 and must be medically fit. As well, Langara College and Capilano College both offer two-year diplomas in Outdoor/Recreation Facilities Management.

Malaspina University College has two-year diploma programs in both Recreation Administration and Physical Education. Applicants require grade 12 and letters of reference from someone in the field.

Continuing Education divisions of some colleges offer national coaching certification and fitness leadership courses, as do sports organizations and groups such as the YM-YWCA.

People working in this field must have exceptional leadership and teaching skills. They must have an ability to motivate others. They need an aptitude for science and mathematics, and good analytical, evaluative, and communications skills. Knowledge of computers may be required.

Working Conditions

In 1995 the average annual earnings for all workers in this occupational group were $13,200, with the 17% who worked full time for the full year making an average of $27,500 in earnings. Average earnings of the 2% of *sports officials* and *referees* who worked full time, full year were higher at $59,800. The respective all-occupation averages in B.C. were $27,900 and $39,400.

Earnings of full-time, full-year *athletes* were lower at $29,800 than the all-occupation average. The average earnings of all athletes were $44,300. The reason for this high figure may be that many of the higher-paid professional athletes work in team sport competitions that do not have year-round schedules. *Program leaders* and *instructors in recreation and sport* (for example, golf, skiing, fitness) make up the majority of the group, and they earned $12,800 on average in 1995. Those who had full-time, full-year work earned an average of $27,000.

Industry sources suggest that $35,000 for full-time, full-year work is average for entry-level workers in this occupational group, and experienced, successful workers' earnings can range from $40,000 to $250,000 for full-time, full-year work. However, a recent graduate survey found that individuals new to coaching and program leadership in recreation earned between $1,290 and $1,480 per month (or approximately $16,000 per year). These earnings are based on part-time work, which suggests that individuals new to this occupation may have difficulty in finding full-time, full-year work. According to statistics, only 43% of workers in this occupational group in 1995 had full-time, full-year work.

This is a large occupational group. The number of employed workers rose from 6,180 in 1990 to 8,330 in 1998. The vast majority (82%) are program leaders and instructors in recreation and sport. Coaches account for 11% of this group, while sports officials and referees account for 5%, and athletes make up the remaining 3%.

Self-employment stands at about 15% for the entire group but is higher among athletes (20%) and almost non-existent among sports officials and referees. By comparison, the rate of self-employment across all occupations in B.C. is 15%. While 59% of the entire group work part time, only 28% of athletes work on this basis. The all-occupation rate for part-time employment in B.C. is 26%.

Unemployment is about the same as the all-occupation average (especially for athletes), but is lowest among coaches. However, 95% of sports officials and referees are employed for only part of the year compared with 69% for the group as a whole. In large part due to the weather, only a small proportion of the largest group, program leaders and instructors in recreation and sport, work full time, all year round.

These workers are employed in many different industries, with the largest concentrations working in amusement and recreation services (56%), personal and household services (12%), local and other government (8%) and health and social services (6%). About 56% of this group are located in the Lower Mainland, 21% are on Vancouver Island, 17% are in the Okanagan/Kootenay, while the remaining 7% are found in Northern B.C. A higher proportion of the athletes (63%) are located in the Lower Mainland.

Women make up a majority (58%) of this occupational group as a result of their strong representation among program leaders and instructors in recreation and sport (63%). They also account for 61% of all coaches. Men make up the majority of athletes, sports officials and referees.

The physical demands, the relatively low wages and the part-time nature of much of the available employment opportunities in this field are reflected in the high representation of very young workers. Almost half of this group (47%) are aged 15 to 24, a very high proportion for this age group, and another 24% fall in the 25 to 34 age group.

Employment Prospects

According to the Canadian Occupations Projections System (COPS), employment for *athletes, coaches, referees* and *related occupations* will grow much faster than the average rate for all occupations. A total of 3,300 employment openings are expected from 1998 to 2008, with two-thirds of these new jobs due to economic growth. The rest will be to replace retiring workers.

Despite the high growth rate, there will not be a large number of openings for *athletes, coaches* and *sports officials*, as they are each small occupations. There will be a total of 110 openings for athletes, 390 openings for coaches, and 170 openings for sports officials and referees to 2008. These will include both new jobs and jobs to replace workers who retire. Openings for program leaders and instructors in recreation and sport, which is the largest group in this occupational classification, are expected to total 2,610 over the projection period.

Employment growth for *program leaders* and *instructors* in recreation and sport who work with local governments is sensitive to government funding levels. Employment for athletes, coaches and referees is also affected by provincial and federal government funding for grants to sports organizations.

More and more people realize that exercise enables them to live, work and function more effectively, and they are including some sort of regular physical activity in their lives. Baby boomers as they age realize that if they pay more attention to physical fitness, they will live longer and more active lives than their parents' generation. Personal trainers now offer their services to a wide variety and expanding base of clients. As long as people remain interested in fitness and health, demand for leisure services in public and private facilities, such as athletic clubs, camps, and sports clinics, should remain high.

Tourism also is expected to increase throughout the next ten years, and this will provide increased opportunities for recreation program leaders. Part-time and seasonal jobs are expected to be plentiful, but there is likely to be strong competition for full-time career positions. Job prospects for most of these occupations will be best for those with bachelor's degrees and extensive experience within their specialization.

Related Occupations

coaches (5252):

- athletic trainers (in 314 therapy and assessment professionals)

program leaders and instructors in recreation and sport (5254):

- recreation and sports program and service directors (in 01/09 middle and other management)
- recreation and sports program supervisors (in 416 policy and program officers, researchers and consultants)

People working in this field must have exceptional leadership and teaching skills. They must have an ability to motivate others. They need an aptitude for science and mathematics, and good analytical, evaluative, and communications skills. Knowledge of computers may be required.

© Stone/Vancouver

6 - SALES AND SERVICE OCCUPATIONS

Skill Level B - Technical, Paraprofessional and Skilled Occupations

621 Sales and Service Supervisors.....342
6221 Technical Sales Specialists, Wholesale Trade.....346
6231 Insurance Agents and Brokers.....348
6232 Real Estate Salespersons and Agents.....349
6233 Retail and Wholesale Buyers.....352
624 Chefs and Cooks.....354
6251 Butchers and Meat Cutters, Retail and Wholesale.....357
6252 Bakers.....359
6261 Police Officers (Except Commissioned).....361
6262 Firefighters.....363
6271 Hairstylists and Barbers.....365
6272 Funeral Directors and Embalmers.....367

Skill Level C - Intermediate Occupations

6411 Sales Representatives, Wholesale Trade (Non-Technical).....370
6421 Retail Salespersons and Sales Clerks.....372
6431 Travel Counsellors.....373
6432 Pursers and Flight Attendants.....376
6433 Airline Sales and Service Agents.....377
6435 Front Desk Agents.....379
644 Tour and Recreational Guides.....381
645 Occupations in Food and Beverage Service.....384
646 Other Occupations in Protective Service.....388
6470 Early Childhood Educators and Assistants.....392
6471 Visiting Homemakers, Housekeepers and Related Occupations.....395
6472 Elementary and Secondary School Teacher Assistants.....397
6474 Babysitters, Nannies and Parents' Helpers.....399
648 Other Occupations in Personal Service.....401

Skill Level D - Labouring and Elemental Occupations

6611 Cashiers.....405
662 Other Sales and Related Occupations.....406
6631 Elemental Medical and Hospital Assistants.....409
664 Food Counter Attendants and Kitchen Helpers.....411
6651 Security Guards and Related Occupations.....414
666 Cleaners.....416
667 Other Attendants in Travel, Accommodation and Recreation.....419
668 Other Elemental Service Occupations.....422

Sales and Service Supervisors

NOC 621

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	10,430	11,680	15,040

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
3,360	2,370	5,730

Annual Growth 1998-2008	2.6%

Main Industries of Employment

Retail Trade	39%
Accommodation and Food Services	22%
Other Service Industries	8%

Employment by Region

Lower Mainland	59%
Vancouver Island	19%
Northern B.C.	7%
Okanagan/Kootenay	16%

Self-employment	8%

Nature of the Work

Sales and *service supervisors* generally conduct sales and provide services as well as supervise and coordinate the activities of their staff.

Retail trade supervisors perform sales-related tasks, and they may supervise retail salespersons, sales clerks, cashiers, grocery clerks, shelf stockers and other elemental sales staff. They are employed in retail establishments and businesses involved in telephone or door-to-door soliciting.

Food service supervisors supervise, direct and coordinate the activities of workers who prepare, portion and serve food. They are employed by hospitals and other health care establishments and by cafeterias, catering companies and other food service establishments.

Executive housekeepers direct and control the operations of housekeeping departments within hotels, hospitals and other establishments.

Dry cleaning and *laundry supervisors* supervise and coordinate the activities of dry cleaning and laundry workers as well as workers in ironing, pressing and finishing. They are employed by dry cleaning and laundry establishments and by laundries in hotels, hospitals and other institutions.

Cleaning supervisors supervise and coordinate the activities of light duty cleaners, specialized cleaners, janitors, caretakers and building superintendents. They are employed by hospitals, office buildings, hotels, motels, schools, commercial establishments and cleaning companies.

Other service supervisors supervise and coordinate the activities of hotel accommodation service clerks, theatre ushers and attendants, reservation clerks, sport and recreation club workers, commissionaires and other service workers. They are employed by service establishments throughout the public and private sectors.

Main Duties

Workers in this occupational group supervise and coordinate the activities of their staff members.

The main duty of *retail trade supervisors*, especially in smaller retail outlets, is to perform sales-related duties and activities. They may also supervise and coordinate sales staff and cashiers, assign sales workers to duties, prepare work schedules, authorize payments by cheque and the return of merchandise, sell merchandise to customers and resolve whatever problems may arise, such as customer complaints and supply shortages. They maintain specified inventory, order merchandise, prepare reports regarding sales volumes, merchandising and personnel matters as well as hire and train or arrange for the training of new sales staff.

Food service supervisors supervise, coordinate and schedule the activities of staff who prepare and portion food, and they estimate and order ingredients and supplies required for meal preparation. They prepare food order summaries for cooks or chefs according to requests from dietitians, patients in hospitals or other customers. They establish methods to meet work schedules, and they maintain records of stock, repairs, sales and waste. They also train staff in job duties, sanitation and safety procedures. They supervise and check the assembly of regular and special diet trays, as well as the delivery of food trolleys to hospital patients, and they ensure that food and service meet quality control standards.

Executive housekeepers establish and implement operational procedures for the housekeeping department. They plan and coordinate the activities of housekeeping supervisors and their crews, coordinate the inspection of assigned areas to ensure that safety standards and departmental policies are being met, select and purchase equipment and supplies, hire and supervise housekeeping staff, maintain financial records and prepare budgets, payroll and employee schedules.

Dry cleaning and *laundry supervisors* supervise, coordinate and schedule the activities of dry cleaning and laundry staff. They establish and implement production routines, coordinate work activities with other departments, monitor quality and production levels, requisition supplies, hire and train or arrange for the training of workers, and they oversee the cleaning of suedes, leathers and other difficult items.

Cleaning supervisors supervise and coordinate the work of light duty, industrial or specialized cleaners and janitors. They inspect sites or facilities to ensure established safety and cleanliness standards are met, and they recommend or arrange for additional services required, such as painting, repair work, renovations or replacement of furnishings and equipment. They also hire and train cleaning staff, prepare work schedules and coordinate activities with those of other departments. In addition, they prepare budgets, estimate costs, keep financial records, receive payment for specialized cleaning jobs and assist cleaners in performing certain duties.

Duties of *supervisors in other service industries* include coordinating, assigning and reviewing the work of hotel, motel and other accommodation services clerks, theatre ushers and attendants, reservation clerks, sport and recreation club workers, commissionaires and other service workers not elsewhere classified. These supervisors establish work schedules and procedures, coordinate activities with other work units or departments, resolve work-related problems, prepare and submit progress and other reports, as well as train workers in job duties, safety procedures and company policies. They also requisition supplies and materials, ensure smooth operation of computer systems, equipment and machinery and arrange for maintenance and repair work. They may perform the same duties as workers supervised.

Example Titles

retail trade supervisors (6211):
- head cashier
- telemarketing supervisor
- department store supervisor
- liquor store supervisor
- newspaper delivery supervisor
- produce department supervisor
- route supervisor, retail sales
- rental service supervisor
- computer sales supervisor

food service supervisors (6212):
- canteen supervisor
- catering supervisor
- cafeteria supervisor, food services

executive housekeepers (6213):
- housekeeping director
- housekeeping manager
- assistant executive housekeeper
- hospital executive housekeeper
- hotel executive housekeeper

dry cleaning and laundry supervisors (6214):
- production supervisor, dry cleaning
- foreman/woman - laundry and dry cleaning

cleaning supervisors (6215):
- window washing supervisor
- head custodian
- head janitor
- carpet cleaning supervisor
- building cleaning supervisor
- head caretaker

other service supervisors (6216):
- supervisor, security guards
- supervisor, commissionaires
- supervisor, club house attendants
- supervisor, theatre attendants
- travel clerk supervisor
- parking lot supervisor
- camp ground supervisor
- tour guide supervisor
- hotel clerk supervisor
- reservations supervisor
- supervisor, ticket takers

Education and Training

These workers are usually selected from employees who have demonstrated leadership qualities and initiative in lower-level jobs. The usual prerequisite is high school graduation, followed by as many as ten years in a related subordinate position or training on the job. Completion of a college or university program in an area relevant to the particular field of work may be advisable. Entry into these types of programs usually requires completion of high school. Recommended post secondary programs include business administration, food service administration, marketing and merchandising or those related to management of restaurants, hotels and resorts. Training in health and safety may be advisable.

All public colleges and university colleges in B.C. offer certificates and/or diplomas in business administration, management and commerce. All public universities, most university colleges, Capilano College, British Columbia Institute of Technology (BCIT) and the Open University offer a bachelor's degree in business administration.

The University of British Columbia (UBC) has a three-year evening lecture program that leads to a diploma in marketing and sales management. University College of the Fraser Valley has a part-time, self-paced marketing and sales certificate available, designed for those working in or new to the field. Capilano College offers a one-year certificate program in retail marketing, which includes an optional work experience component. Graduates may go on to earn a diploma in business administration by completing an additional year of study.

BCIT, College of New Caledonia, Douglas College and Kwantlen University College offer two-year diplomas in marketing management. The BCIT diploma includes a professional sales option and a tourism management option. Graduates of these programs can transfer into third year of a bachelor's degree in administrative studies at the Open University. Langara College has a two-year program in marketing and sales. The University of Northern British Columbia (UNBC) and UBC both allow specialization in marketing within their business administration programs. Individual marketing and sales courses are available at various colleges and university colleges in B.C. as well as within business, commerce and economics degree programs at universities.

Okanagan University College's Continuing Education Department offers a 90-hour program in management skills for supervisors. Malaspina University College offers a

12-day Management Skills Certificate. The Open University offers a one-year Management Studies Certificate and a two-year diploma. (The diploma can be used to gain entry into a bachelor's degree in administrative studies at the Open University.)

The University of Victoria offers a bachelor's degree in commerce, with a concentration in tourism management. Admission is competitive. Contact the Faculty of Business for more details.

North Island College, Vancouver Community College (VCC) and University College of the Cariboo offer a part-time certificate program in food and beverage management for those already in or entering the field. Admission requires grade 12 or equivalent and some tourism front-line food and beverage work experience. Langara College has a two-year program in nutrition and food service management. Applicants with previous related work experience have an advantage. Camosun and Douglas Colleges offer a two-year program in hotel and restaurant administration/management. Admission requires practical relevant work experience or completion of a secondary school preparatory program.

Most colleges and university colleges offer tourism management certificates and/or diplomas. Malaspina University College, University College of the Cariboo, Capilano College, University of Victoria and the Open University offer a bachelor's degree in hospitality and tourism management. North Island College offers three programs in this area, including a six-month tourism career entry program and an eleven-month resort management program. Admission to the second program requires completion of the first one, or six months' relevant work experience. Both programs require applicants to have first aid certification and to undergo a mathematics assessment and a personal interview. The third program is a variable-length, part-time certificate program in food and beverage management designed for those entering or already working in the field.

Selkirk College offers a two-year diploma in resort and hotel management. Applicants must have relevant references and good English and mathematics skills. An interview is also necessary. VCC offers a two-year Hospitality Administration Diploma. Applicants need relevant work experience and proven good health. Certificates are also awarded at VCC following completion of part-time tourism professional programs to allow those working in the field to upgrade. Prerequisites vary depending on the course of study. UNBC offers a bachelor's degree in resource-based tourism.

Sales and service supervisors require excellent communication and human resource management skills as well as confidence and initiative. Research and organizational skills and a thorough understanding and enjoyment of marketing and sales is vital. Computer skills are often necessary. Continuing education regarding the products and services being sold is essential.

Working Conditions

Sales and *service supervisors* work in retail or service outlets, in restaurants, hotels, dry cleaning establishments, in offices or other facilities located close to where their staff work, or they go out with their staff/co-workers to locations where they provide their services. They must divide their time between retail or service activities, administrative functions and supervisory duties.

Generally, the larger the organization, the more time is spent performing administrative or supervisory duties. However, the main responsibility for most sales and service supervisors is still the actual performance of sales or service activities.

Supervisors have frequent interaction either in person, by telephone or by computer with employees, company management or customers. Other duties performed outside their usual workplace may involve attending meetings, making presentations and visiting other retail outlets or service facilities.

In 1995 the average annual earnings for all workers in this occupational group were $25,600, with those who worked full time for the full year receiving an average of $31,500. Earnings for food service supervisors and executive housekeepers were generally lower. The respective all-occupation averages in B.C. were $27,900 and $39,400.

A recent graduate survey found that individuals entering this occupational group as retail trade supervisors, food service supervisors and other service supervisors earned between $1,450 and $1,750 per month for full-time work.

The number of employed workers rose from 10,430 in 1990 to 11,680 in 1998. The largest occupations in this group are retail trade supervisors (48%), food service supervisors (20%) and cleaning supervisors (12%). The occupations of retail trade supervisor and retail manager have been classified separately in this publication, but some of their duties may overlap. This may have been the cause for some industry observers to speculate that the number of retail trade supervisors in B.C. could be larger than is listed here.

Self-employment for the entire group stands at 8% but is higher among dry cleaning and laundry supervisors (19%) and cleaning supervisors (22%) and lower among executive housekeepers (3%). By comparison, the rate of self-employment across all occupations in B.C. is 15%. Typically, supervisory duties require attention on a full-time basis all year round, and this is reflected in the work pattern of sales and service supervisors. About 17% of this group work part time, lower than the provincial average of 26% for all occupations. Unemployment and part-year work in this group are both lower than the all-occupation averages.

Sales and service supervisors are employed in a wide range of industries, but the largest concentrations work in retail trade (39%), accommodation and food services (22%) and other services, such as building and dwelling servicing (8%). About 59% are located in the Lower Mainland, 19% are on Vancouver Island, 16% are in the Okanagan/Kootenay, and 7% are in Northern B.C.

Women account for just over half (52%) of this entire group but make up 61% of food service supervisors and 75% of executive housekeepers.

The average age for this group is 37, very close to the all-occupation average of 38. As well, the age distribution for the entire group is similar to the average for all occupations in B.C., but there is a high proportion of food service supervisors aged 15 to 24 as well as an unusually high proportion of dry cleaning and laundry supervisors aged 55 to 64.

Employment Prospects

This is a very large occupational group, made up of about 11,680 workers in B.C. in 1998. The Canadian Occupation Projection System (COPS) projects an annual employment growth rate of 2.6%, much faster than the average for all occupations. According to this projection, 5,730 positions will become available from 1998 to 2008. The majority of these openings (59%) will result from growth in the number of new jobs. The remainder will result from the replacement of retired workers.

Projections for the wide range of occupations in this occupational group vary considerably from occupation to occupation. According to projections, 41% of the employment openings will be filled by *retail trade supervisors*. Employment of *food service supervisors* will account for 25% of the projected openings. This occupation is projected to grow at an annual rate of 3.6%, much faster than the all-occupation average. This high growth is a consequence of the concentration of these professionals in the accommodation and food services industry, which is growing at approximately the same rate. *Other service supervisors* will fill 15% of the openings, while *cleaning supervisors* will fill 11%. The remaining 8% of the openings will be filled by *executive housekeepers* and *dry cleaning* and *laundry supervisors*.

There are a number of factors contributing to the employment growth of this occupational group. Employment in the accommodation and food services industry, which employed roughly 22% of these professionals in 1998, is expected to grow much faster than the economy-wide average from 1998 to 2008. There are a number of factors driving this industry. More families are eating out more frequently. Perhaps more importantly, the rapidly growing tourism sector is also contributing to growth in the accommodation and food services industry. According to Tourism B.C, there were nearly twenty-two million overnight visitors to B.C. in 1998, an increase of 3.5% from 1997. The weak Canadian dollar is expected to attract a growing number of U.S. and European tourists to B.C. Canadian travelers will also have an added incentive to travel domestically, and B.C. is a popular tourist destination in Canada. An additional indicator that tourism in B.C. is on the rise is that about 8.5% more tourists came to B.C. on cruise ships in 1999 than in 1998. More than a third of these tourists spent at least one night in Vancouver, and 75% deemed eating in restaurants as a favourite activity. The increase in tourism is largely responsible for the astonishing 28% increase in hotel rooms in the greater Vancouver area from 1996 to 2000. Despite this increase in the number of hotel rooms, industry sources indicate that shortages of rooms still exist during peak summer seasons.

Growth in the retail trade industry will also be a source of employment growth for these workers. Employment in this industry, which employed roughly 40% of these professionals in 1998, is expected to grow at a rate close to the economy-wide average from 1998 to 2008. Employment growth in this industry reflects the growth of the economy as a whole because of the wide range of products sold and close ties to most other industries in the economy. This means that there are areas of high growth, such as the tourism sector, and areas of low growth. Many of the openings that become available for this industry will go to these professionals due to their concentration in the tourism sector. However, the increasing availability and use of the Internet will continue to increase on-line purchases, which may limit the number of retail establishments. To some extent, this may also limit employment growth in the retail trade industry. Other technologies that now exist in larger retail establishments, such as computerized registers and tracking systems, enable managers to monitor the performance of sales staff without the need for supervisors. This will limit the growth of retail sales supervisors.

Due to technological advances, such as the widespread use of computerized inventory control and order-entry systems, computer skills are essential for those intending to enter or remain in these fields. Potential entrants who have experience with these and other new technologies will have an advantage over others seeking employment in these fields of work.

Although job prospects for most service supervisors look promising, competition will remain keen. Services that are linked to government funding, such as in hospitals or educational institutions, will be under restraint and will offer few opportunities for supervisors.

Additional Information

For those who wish to work in the tourism industry
Canadian Tourism Human Resource Council
http://www.cthrc.ca

Pacific Rim Institute of Tourism http://www.prit.bc.ca

Related Occupations

retail trade supervisors (6211):

- retail trade managers (in 01/09 middle and other management)

food service supervisors (6212):

- maîtres d'hôtel and hosts/hostesses (in 645 occupations in food and beverage service)
- restaurant and food service managers (in 01/09 middle and other management)
- banquet captains (in 645 occupations in food and beverage service)

executive housekeepers (6213):

- accommodation service managers (in 01/09 middle and other management)
- maintenance managers (in 01/09 middle and other management)

dry cleaning and laundry supervisors (6214):

- dry cleaning and laundry occupations (in 668 other elemental service occupations)
- dry cleaning services managers (in 01/09 middle and other management)

cleaning supervisors (6215):

- specialized cleaners (in 666 cleaners)
- building maintenance supervisors (in 721 contractors and supervisors, trades)

other service supervisors (6216):

- accommodation service managers (in 01/09 middle and other management)
- other services managers (in 01/09 middle and other management)

Technical Sales Specialists, Wholesale Trade

NOC 6221

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	7,420	11,540	15,060

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
3,520	1,780	5,300

Annual Growth 1998-2008	2.7%

Main Industries of Employment

Wholesale Trade	38%
Education	12%
Professional Business Services	11%

Employment by Region

Lower Mainland	74%
Vancouver Island	11%
Northern B.C.	4%
Okanagan/Kootenay	10%
Self-employment	14%

Nature of the Work

Technical sales specialists involved in wholesale trade sell a range of technical goods and services, such as scientific and industrial products, electricity, telecommunications services and computer services, to governments and to commercial and industrial establishments. They are employed by establishments that produce or provide technical goods and services, such as pharmaceutical companies, industrial equipment manufacturing companies, computer services firms, engineering firms and hydroelectric companies. Technical sales specialists who are supervisors are included in this unit group.

Main Duties

Technical sales specialists promote sales to existing clients. They also identify and solicit potential clients. Workers in this occupation assess a client's needs and resources and recommend the appropriate goods or services. They provide input into product design, such as how goods or services must be tailored to suit a client's individual needs.

Reports and proposals, which illustrate the benefits of using specific services, are developed for use in sales presentations. The costs of installing and maintaining equipment or services are also included in proposals.

Technical sales specialists prepare and administer sales contracts. These workers also consult with clients after sales to resolve problems and to provide ongoing support.

Finally, workers in this occupation may supervise the activities of other technical sales specialists.

©Stone/Vancouver

Example Titles

- construction equipment sales representative
- technical sales supervisor
- aircraft sales representative
- sales representative, technical sales
- electricity sales representative
- communication equipment sales representative
- heavy equipment sales representative
- medical instrumentation sales engineer
- industrial supplies sales representative
- software sales representative
- computer systems sales representative

Education and Training

Good sales ability on its own is insufficient for a successful career in an occupation that requires salespeople to understand the engineering details of their products as well as the business requirements of their customers. While completion of high school may be sufficient, most employers prefer applicants with a college certificate or diploma or a university degree. For example, a bachelor's degree in computer science, mechanical engineering or electrical engineering is an asset for individuals looking for a sales job in the electronic data-processing industry. Programs in marketing and sales may also be advantageous. In addition, experience in sales or in a technical occupation related to the product or service may be required. Sometimes in-house training programs are available. For information about obtaining certificates, diplomas and degrees relevant to particular products see the appropriate occupational profile.

The University of British Columbia (UBC) has a three-year evening lecture program that leads to a diploma in marketing and sales management. The University College of the Fraser Valley has a part-time, self-paced marketing and sales certificate available, designed for those working in the field or new to the field. Capilano College offers a one-year certificate program in retail marketing that includes an optional work experience component. Graduates may go on to earn a diploma in business administration by completing an additional year of study.

The British Columbia Institute of Technology (BCIT), College of New Caledonia, Douglas College and Kwantlen University College offer two-year diplomas in marketing management. The BCIT diploma includes a professional sales option. Graduates of these programs can transfer into the third year of a bachelor's degree in administrative studies at the Open University. Langara College has a two-year program in marketing and sales. The University of Northern British Columbia (UNBC) and UBC both allow specialization in marketing within their business administration programs. Individual marketing and sales courses are available at various colleges and university colleges in B.C. as well as within business, commerce and economics degree programs at universities.

In addition to formal education, *technical sales specialists* must be good communicators who relate well to people. That is, they need to be able to understand what customers want and have the ability to persuade and influence them in favour of a product or point of view. They require persistence and an ability to solve problems and resolve complaints when necessary. Computer skills are often required, and these people must have a willingness to keep up-to-date about new products and services. An ability to develop niche markets may be important, and a willingness to travel is often required.

Working Conditions

Some *manufacturer* and *wholesale sales* representatives have large territories and do considerable travelling. They may be away from home for several days or weeks at a time. Others work near their home base and do most of their travelling by automobile. Due to the nature of the work and the amount of travel, sales representatives typically work more than 40 hours per week. However, most sales representatives also have the freedom to determine their own schedule. In addition, these workers may be able to arrange their appointments so that they have flexibility in their time off.

The estimated average annual earnings for all B.C. workers in these occupations were $41,700 in 1995, with the 70% who worked full time, full year earning $48,100 on average. The respective all-occupation averages were $27,900 and $39,400. Industry sources also report that effective computer system sales representatives can enjoy incomes in excess of $100,000 per year.

A recent graduate survey found that entry-level wages for these workers averaged $2,590 per month for full-time work. At approximately 41 hours per week, new workers in these occupations may earn between $15 to $16 per hour.

The number of workers who worked in this occupational group increased dramatically from 7,420 in 1990 to approximately 11,540 in 1998. In addition, part-time work is very low (9%). The all-occupation rate for part-time employment in B.C. is 26%. Of the workers in this group, 14% are self-employed, very close to the overall provincial average of 15%. The rate of unemployment is lower than the average for all occupations.

Technical sales specialists are mainly employed in wholesale trade (38%), in education (12%), and in professional business services (11%). The rest can be found in industries such as telecommunications, business and electrical and electronic products. Most technical sales specialists are located in the Lower Mainland (74%), and Northern B.C. is underrepresented by these workers (4%) according to population distribution.

There are fewer women (23%) than in other occupations, and by comparison, women account for 46% of workers across all occupations. There are very few workers in the 15 to 24 age group. However, there are more workers aged 25 to 34 (33%) and 35 to 44 (33%) than in other occupations. This suggests that the number of employment opportunities resulting from retirements will be limited.

Employment Prospects

This is a very large occupational group, made up of about 11,540 workers in B.C. in 1998. Projections from the Canadian Occupation Projection System (COPS) call for a growth rate of 2.7%, much faster than the average for all occupations. According to this projection, 5,300 positions will become available from 1998 to 2008. The majority of these openings (66%) will come from growth in the number of new jobs. The remainder will result from the replacement of retired workers.

There are a number of factors contributing to the employment growth of this occupational group. Advances in technology will continue to improve products but at the same time increase their complexity. This will increase the need for *technical sales specialists* to install and explain new and improved product features, provide training sessions and often provide ongoing technical support. Most new job openings will probably be in the growing areas of electrical, electronic and computer or communications systems products.

Rapid technological change means those working in these occupations must stay abreast of ever-changing product lines available on the market. Employers will also have a preference for salespersons with second language abilities and those with good knowledge of import and export requirements, both of which reflect the trend toward globalization.

Those who are seeking jobs in this field should check for job advertisements in the newspapers and also directly approach employers in high-tech product companies in growing sectors. A further avenue of pursuit for job seekers is the many private recruiting firms who specialize in sales.

Progression to sales management positions is possible with additional training or experience.

Related Occupations

- sales, marketing and advertising managers (in 01/09 middle and other management)
- retail salespersons and sales clerks (6421)
- sales representatives, wholesale trade (non-technical) (6411)

Insurance Agents and Brokers

NOC 6231

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	6,980	6,360	6,300

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
620	1,240	1,860

Annual Growth 1998-2008 0.9%

Main Industries of Employment

Finance, Insurance, and Real Estate	97%
Education	1%

Employment by Region

Lower Mainland	64%
Vancouver Island	15%
Northern B.C.	7%
Okanagan/Kootenay	14%

Self-employment 12%

Nature of the Work

Insurance agents and *brokers* sell automobile, fire, life, property, marine and other types of insurance to businesses and individuals. Insurance agents are employed by individual insurance companies to sell that company's products to clients. Insurance brokers are employed by brokerage firms and seek appropriate insurance products through several insurance companies on behalf of clients.

Main Duties

Insurance agents and *brokers* sell automobile, fire, health, life, property, marine, aircraft and other types of insurance to clients. They establish client insurance coverage, calculate premiums and establish methods of payment. Workers in these occupations provide information concerning group and individual insurance packages, the range of risk coverage, benefits paid and other policy features. They ensure that the appropriate forms, medical examinations and other policy requirements are completed. Finally, they respond to clients' inquiries when claims are made.

Example Titles

- insurance sales representative
- insurance broker
- insurance agent

Education and Training

Entry into insurance sales usually requires a minimum of high school graduation and completion of provincial licensing requirements. Graduation from a college or university program in business administration or financial management or a bachelor's degree in an area of arts or science are often an asset.

Entry can be made as a salesperson or Agent Level 2. An applicant for a salesperson's licence must have successfully completed the Insurance Council qualifying examination or courses that are approved as equivalent. Such courses are offered by the Insurance Brokers Association of B.C., the Canadian Accredited Insurance Brokers and the Insurance Institute of Canada. Applicants for a salesperson's licence need not have insurance experience.

People entering at Agent Level 2 require more courses than a salesperson to meet the licensing requirements but do not require insurance experience. Salespeople are more restricted than agents in the work they are licensed to perform.

Licensing for all people involved in the sale of insurance is compulsory in B.C. There are different licence classifications for different types of insurance agents. Progression is possible through a combination of education, experience and examinations. Continuing education is also required to maintain a licence. Further details about licensing requirements can be obtained from the Insurance Council of B.C., Suite 300, 1040 W. Georgia Street, Vancouver, V6E 4H1 (604) 688-0321.

All public colleges and university colleges in B.C. offer certificates and/or diplomas in business administration, management and commerce. All public universities, most university colleges, Capilano College, British Columbia Institute of Technology (BCIT) and the Open University offer a bachelor's degree in business administration. BCIT offers a two-year diploma in financial management, and Langara College offers a two-year certificate in business, finance and investment management, which includes courses specific to the insurance field.

Insurance agents and brokers should be able to communicate effectively and be persuasively persistent. They should have an interest in details and in helping people achieve their financial goals. They must be willing to keep up-to-date with new information. Since they usually work without supervision, they must be able to plan their time well. Mathematics and computer skills are important, as is a willingness to work long hours. Business competence is important for those who run their own businesses.

Working Conditions

Most *insurance agents* and *brokers* work in small offices, contacting clients and providing insurance policy information. However, most of their time is spent outside their offices, travelling locally to meet with clients and close sales. They generally arrange their own hours of work and often schedule evening and weekend appointments for the convenience of clients. Many work more than 40 hours per week.

The estimated average earnings for all B.C. workers in this occupational group was $32,900, with the 61% of workers who worked full time, full year earning $38,800. The respective all-occupation averages are $27,900 and $39,400.

The number of workers who worked in this occupational group increased very slowly between 1990 and 1998, with approximately 6,300 employed in 1990 and 6,360 in 1998. These figures suggest a slow growth rate for this group, and projections for new positions suggest this trend will continue. The rate of part-time work is lower than the provincial average of 26% for all occupations, with 16% working part time. At 12%, self-employment is slightly lower than the provincial average of 15%, and unemployment is also lower than the provincial average.

A recent graduate survey reported that new entrants into these occupations earned an average of $1,920 per month based on full-time work.

Almost all insurance agents and brokers (97%) are employed in finance, insurance and real estate. Most of the workers in this group are distributed according to the regional distribution of the entire workforce. However, there are slightly more in the Lower Mainland (64%).

More than half (55%) of the workers in this occupation are women, higher than the provincial average for all occupations (46%). The age distribution for this group is close to the all-occupation average, except in the case of workers aged 15 to 24 for whom representation in this occupation is lower.

Employment Prospects

This is a large occupational group, made up of about 6,360 workers in B.C. in 1998. Projections from the Canadian Occupation Projection System (COPS) calls for a growth rate of 0.9%, slower than the average for all occupations. According to this projection, 1,860 positions will become available from 1998 to 2008. The majority of these openings (66%) will result from the replacement of retired workers, and the remainder will come from growth in the number of new jobs.

Employment growth of these professionals is driven by the finance, insurance and real estate industry. This industry employs almost all (97% in 1998) of these professionals, and its employment is projected to grow at about the same overall rate as this occupational group.

Changes in technology and sales techniques suggest that employment of agents and brokers will not keep pace with the rising level of insurance sales. Agents now use computers to access an abundance of information on potential clients. This ease of access to information increasingly allows agents to save time and money by carefully crafting individually tailored plans. Consequently agents will be able to handle a greater volume of sales. The trend toward agents selling a variety of products, including self-insurance and group policies, will also cause employment to rise more slowly than the volume of insurance sales.

Expert systems will be used increasingly in the insurance industry, and computerized telecommunications will link brokerages to insurance firms. The numbers of potential customers looking up insurance offers on the Internet are increasing. *Insurance agents* and *brokers* will need to develop strong computer skills to exploit these technologies and to match competition from other locations.

Additional Information

Insurance Brokers Association of B.C. http://www.ibabc.org

Insurance Institute of Canada http://iic.lasso.net

Related Occupations

- insurance underwriters (1234)
- insurance managers (in 01/09 middle and other management)

Real Estate Agents and Salespersons

NOC 6232

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	11,280	11,070	12,170

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
1,100	2,150	3,250

Annual Growth 1998-2008	1.0%
Main Industries of Employment	
Finance, Insurance, and Real Estate	96%
Education	2%
Construction	1%
Employment by Region	
Lower Mainland	69%
Vancouver Island	16%
Northern B.C.	4%
Okanagan/Kootenay	11%
Self-employment	24%

Nature of the Work

Real estate salespersons and *agents* facilitate, conduct or advise on all the necessary procedures involved in the sale or purchase of houses, apartments, commercial buildings, land and other real estate and are employed in the real estate industry.

Main Duties

Workers in this occupational group solicit property sales listings from prospective vendors and assist vendors in selling property by establishing asking price, advertising the property, listing the property with multiple listing services and conducting open houses for prospective buyers.

They assist prospective buyers in selecting, visiting, inspecting and making offers to purchase real estate properties. They advise clients on market conditions, prices, mortgages, legal requirements and related matters and they draw up sales agreements for approval of purchaser and seller. They may also rent or lease properties on behalf of clients.

©Stone/Vancouver

Example Titles

- residential real estate salesperson
- supervisor, real estate agents
- commercial real estate agent
- estate agent
- property manager

Education and Training

It is mandatory to be licensed with the Real Estate Council of British Columbia, the licensing and regulatory body, to practise as a *real estate salesperson* or *real estate agent* in the province of B.C. After two years of experience salespeople can become real estate agents. Agents may operate independently by obtaining a broker's licence.

The Faculty of Commerce and Business Administration at the University of British Columbia (UBC), through its Real Estate Division, provides all of British Columbia's (and much of Canada's) real estate educational needs. These include correspondence courses that prepare people to write the salesperson and agent pre-licensing exams, correspondence courses in various subject areas in this field (such as real property assessment and market value appraisals), a four-year Diploma in Urban Land Economics (DULE), a nationally recognized certificate program in real property assessment and a national correspondence program for real property appraisal. The Division also offers a post-degree completion program that leads to the Bachelor of Business in Real Estate (BBRE), a part-time program delivered by distance education methods. UBC also offers a Bachelor of Commerce with an urban land economics option and a four-year diploma program in urban land economics (which may be taken by correspondence), both of which satisfy the educational requirements needed to write the sales exam.

The British Columbia Institute of Technology offers a specialization in real estate studies within its two-year Marketing Management diploma program, and this also prepares students to write the sales exam. Langara College offers a two-year program in business, finance and investment management, with courses specific to the real estate industry. The Open University offers individual courses that satisfy some of the educational requirements needed in order to write the sales exam.

People in this line of work must have an interest in economics, marketing and the law as it applies to property. They must be able to organize their time, withstand tension and work long and irregular hours. They must have maturity, perseverance and enthusiasm. They must be able to communicate well, and they need strong interpersonal skills. They require a genuine interest in people and in helping clients meet their needs, including securing services of others, such as appraisers or lawyers. Mathematics and computer skills are needed. Continued education and updating of skills are necessary for success. The B.C. Real Estate Association offers an optional aptitude test for anyone thinking of entering the field.

Working Conditions

While real *estate salespersons* and *agents* usually work out of an office, much of their time is spent at a variety of locations. Their work often exceeds 40 hours a week, and much of this work takes place during evenings and weekends in order to accommodate clients and prospective clients. They normally work on a commission basis.

This work calls for personal characteristics, such as maturity and tact, in that the product involved is usually the largest purchase most individuals will ever make in their lives. Clients are looking for advice and direction from someone who fully understands the needs and concerns of people at various stages of their lives.

In 1995 average annual earnings for all workers in this occupational group were $38,600, with the 65% of workers employed full time for the full year receiving an average of $42,500 in earnings. While these figures are well above the respective all-occupation averages of $27,900 and $39,400, it should be noted that there is a wide range of earnings for real estate salespersons and agents. Some have very high earnings, but a larger number have modest incomes. Some are not able to make a living from their real estate sales and are forced to leave the field to obtain other work.

A recent graduate survey of these occupations found that most new entrants to this field worked full time (approximately 44 hours per week) and earned on average $2,580 per month. For those individuals who are starting their careers as real estate agents and salespeople, annual earnings of $31,000 might be expected for motivated, full-time workers who are still building a client base.

This line of work is very competitive, and most workers find that their incomes can be subject to frequent fluctuation. It can be lucrative, but it can also be volatile. Workers must be prepared to deal with this uncertainty because they are not permitted to work at another job while holding a real estate sales licence. Workers in this group who decide to accept employment outside this field are required to relinquish their licences.

This is a very large occupational group. The number of employees in this group stood at 11,070 in 1998, down from 11,280 in 1990. A downturn in the economy and a lack of consumer confidence may have had a negative impact on these occupations.

Many workers in this group are affiliated with a real estate company, but self-employment is listed at 24%, which is higher than the all-occupation average of 15%. Approximately 14% work part time (the all-occupation rate for part-time employment in B.C. is 26%), with more women (21%) working part time than men (10%). The relatively low part-time rate, combined with very low unemployment, may lead to the conclusion that the labour market for this occupational group is booming. A more accurate assessment may be that it has simply become more competitive. A slower real estate market in 1995 prompted about 2,000 agents in B.C. to leave this field and switch careers. Those who remain in this field must continue to upgrade their marketing and communication skills in order to remain competitive.

A significant segment of this group work only part of the year (29%). For some of these people this may be caused by slow periods in the housing market during certain times of the year, while for others it could be a lifestyle choice that enables them to take more leisure time or spend more time with family.

Almost all (96%) of this occupational group work in the finance, insurance and real estate industry. The majority of these workers (69%) are found in the Lower Mainland, while 16% are on Vancouver Island, about 11% are in the Okanagan/Kootenay, and Northern B.C. has 4%.

Women account for 40% of this occupational group. The largest age concentration of workers is people in their middle years, which reflects two factors. First, some time is required to establish a sufficient client base in this field, and second, there is a trend toward leaving another line of work later in life for the flexible schedule associated with these occupations. The average age of these workers is 45, higher than the all-occupation average of 38. As well, significantly more are in the 45 to 54 age bracket, 34% compared to 21% for all occupations, and 15% are in the 55 to 64 group, compared to 9% for all occupations. In addition, many of these workers continue to practise in this field after the usual retirement age.

Employment Prospects

This is a vary large occupational group, made up of about 11,070 workers in B.C. in 1998. The Canadian Occupational Projection System projects employment to grow at a rate of 1.0%, slower than the average for all occupations. According to this projection, a total of 3,250 positions will become available from 1998 to 2008. The majority of these openings (66%) will result from the replacement of retired workers, and the remainder will result from growth in the number of new jobs. Due to the challenges of becoming established in this field and earning a satisfactory income from sales commissions, there is a high rate of worker turnover. This will create many additional openings.

There are a number of factors responsible for the low employment growth of *real estate agents* and *salespersons*. Employment is driven by the finance, insurance and real estate industry, which employs almost all of these professionals (96% in 1998). Employment in this industry is projected to grow slightly more slowly than the employment in this occupational group, but both will continue to be slowed by poor housing market conditions. Factors that affect the housing market include the size and age structure of the population, migration from other provinces and internationally, mortgage interest rates, family income, consumer spending and regional wealth. Other industry-specific circumstances, such as general concerns about poor construction of condominiums and local government development and land use policies, also affect the housing market.

The increasing advances in and availability and use of computer technology will also continue to reduce the growth in employment of this occupational group. Some real estate companies are using computer-generated images to show houses to customers without even leaving the office. Technologies such as this will continue to increase the productivity of these professionals enabling each agent to serve more clients than ever before. In addition, prospective customers now can use the Internet to search for properties that meet their criteria as well as to gain other relevant information themselves without hiring the services of a real estate agent.

Competition for positions in this field will remain keen through to 2008. Many beginners become discouraged and eventually decide to leave this highly competitive field. According to industry sources there is a current surplus of 3,000 to 5,000 *real estate agents* and *salespersons* in the Lower Mainland area. Full-time work and dedicated commitment are more necessary now than ever before if a new agent is to become established.

Those with well-developed marketing skills, who possess a high level of initiative and self-motivation, will be in the best position to develop a strong client base. Successful agents often find the job rewarding.

Additional Information

British Columbia Real Estate Association
http://www.bcrea.bc.ca

Real Estate Council of British Columbia
http://www.realestatecouncil.bc.ca

Related Occupations

- assessors, valuators and appraisers (1235)
- insurance, real estate and financial brokerage managers (in 01/09 middle and other management)
- mortgage brokers (in 1114 other financial officers)
- rental agents (in 1224 property administrators)
- right-of-way agents (in 1225 purchasing agents and officers)

Retail and Wholesale Buyers

NOC 6233

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	1,910	2,380	3,260

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
880	540	1,420

Annual Growth 1998-2008	3.2%
Main Industries of Employment	
Retail Trade	54%
Wholesale Trade	29%
Gas Distribution Utilities	2%
Employment by Region	
Lower Mainland	74%
Vancouver Island	12%
Northern B.C.	6%
Okanagan/Kootenay	8%
Self-employment	13%

Nature of the Work

Retail and *wholesale buyers* buy merchandise for resale by retail and wholesale establishments and are usually responsible for the merchandising operations of retail establishments. Retail and wholesale buyers who are assistants are included in this unit group.

Main Duties

Workers in this occupational group review requirements of establishments and determine quantity and type of merchandise to purchase. They study market reports, trade periodicals and sales promotion materials and visit trade shows, showrooms, factories and product design events. They select the merchandise that best fits the establishment's requirements.

Retail and *wholesale buyers* also interview suppliers and negotiate prices, discounts, credit terms and transportation arrangements. They oversee distribution of merchandise to outlets and maintain adequate stock levels. They may also supervise the work of other retail buyers and specialize in a particular merchandise line.

Example Titles

- assistant buyer
- buyer - retail and wholesale
- chief buyer
- clothing buyer
- food buyer
- produce buyer
- merchandiser

Education and Training

A college diploma or university degree in business, marketing or a related program are usually required in order to work in this field as well as experience as a sales representative or sales supervisor. Specialization is possible with experience or through completion of product-related training courses.

All public colleges and university colleges in B.C. offer certificates and/or diplomas in business administration, management and commerce. All public universities, most university colleges, Capilano College, British Columbia Institute of Technology (BCIT) and the Open University offer a bachelor's degree in business administration.

The University of British Columbia (UBC) has a three-year evening lecture program that leads to a diploma in marketing and sales management. University College of the Fraser Valley has a self-paced, part-time marketing and sales certificate designed for those working in or new to the field. Capilano College offers a one-year certificate program in retail marketing that includes an optional work experience component. Graduates may go on to earn a diploma in business administration by completing an additional year of study.

BCIT, College of New Caledonia, Douglas College and Kwantlen University College offer two-year diplomas in marketing management. The BCIT diploma includes a professional sales option and a tourism management option. Graduates of these programs can transfer into third year of a bachelor's degree in administrative studies at the Open University. Langara College has a two-year program in marketing and sales. Both the University of Northern British Columbia (UNBC) and UBC allow specialization in marketing within their business administration programs. Individual marketing and sales courses are available at various colleges and university colleges in B.C. and also within business, commerce and economics degree programs at universities. The Open University offers a managerial accounting course that is recognized by the Purchasing Management Association of Canada.

Excellent communication skills are necessary in order to succeed in this field. Initiative and a willingness to take intelligent risks are needed. Computer skills are usually necessary, as is an ability to analyse information quickly and accurately. An ability to work well under stress is often required.

Working Conditions

Most *retail* and *wholesale buyers* work in comfortable, well-lit offices in stores, corporate headquarters or production facilities. They often work more than a 40 hour week because of special sales, conferences, or production deadlines. Evening and weekend work is common. For those working in retail trade, this is especially true prior to holiday seasons. Buyers often work under great pressure, since wholesale and retail stores are so competitive. Traveling is usually required, and most buyers spend at least several days a month on the road. Buyers in the fashion industry often travel outside Canada. Retail buyers often earn cash bonuses based on their performance and may receive discounts on merchandise bought from the employer.

Average 1995 earnings were $33,900 for all workers in these occupations, compared to $27,900 for the B.C. all-occupation average. Earnings for those 65% employed full time, full year were $41,000, compared to $39,400 for the B.C. all-occupation average.

Retail and wholesale buyers are a medium-sized occupational group in B.C., with 1,910 workers employed in 1990 and about 2,380 in 1998. However, some industry experts are of the opinion that there is a greater number of retail and wholesale buyers in B.C. A recent graduate study found that new entrants into these occupations earned an average of $1,840 per month for full-time work. Assuming that these individuals find and keep full-time, full-year work, they would have an annual starting wage of $22,100.

About 13% of this group are self-employed, compared to 15% for the B.C. all-occupation average. Only 14% are employed part time, compared to 26% for the B.C. all-occupation average. Industry sources report that the trend is toward greater use of contract and part-time work in these occupations. Unemployment for this group is lower than the average for all occupations. Seasonal fluctuations are not a factor for these occupations.

Buyers are employed mainly in retail trade (54%) and in the wholesale trade (29%). A great majority of them are located in the Lower Mainland (74%), while 12% are on Vancouver Island, 8% are in the Okanagan/Kootenay region, and 6% are in Northern B.C

Women make up 46% of the workers in this group, the same proportion as the B.C. all-occupation average (46%). However, women earn significantly less for full-time, full-year work than their male counterparts ($35,700 and $45,200 respectively).

The average age of buyers is 39, just over the all-occupation average for the province, and there are fewer workers in the 15 to 24 age group than the average across all occupations.

Employment Prospects

This is a medium-sized occupational group, made up of about 2,380 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment for this group to grow at a rate of 3.2%, much faster than the average for all occupations. According to this projection, 1,420 positions will become available from 1998 to 2008. The majority of these openings (62%) will result from growth in the number of new jobs, and the remainder will result from the replacement of retired workers.

The retail and wholesale trade industries together employ most of these professionals (over 80% in 1998). Employment in both of these industries combined is only expected to grow about as fast as the average for all occupations from 1998 to 2008. These industries tend to reflect the employment growth of the economy as a whole because of the wide range of products sold and close ties to most other industries in the economy. The higher rate of growth for *retail* and *wholesale buyers* than for the industries that employ them reflects the trend toward an increase in smaller businesses, each of which require buyers, at the expense of the larger business.

Several factors could act to reduce the employment growth rate of this occupational group below the COPS forecasted rate. The retail trade industry includes all establishments that sell goods (such as gasoline, groceries, construction supplies and tooth picks) for use by consumers and households. The wholesale trade industry supplies these goods to retailers. Growth in these industries is currently being driven by a rapidly growing tourism sector and a weak Canadian dollar, which will continue to encourage the export of Canadian goods. However, the increasing availability and use of the Internet will continue to increase on-line purchases, which may limit growth in the number of retail establishments. To some extent this may also limit employment growth in the retail industry. Many establishments now have computerized systems in place that automatically track and adjust inventories at the checkout counter. The increasing use of computerized technologies such as this will limit the demand for retail and wholesale buyers, particularly for purchasing assistants and other lower-level buyers included in this occupational group. Mergers and the resulting consolidation of purchasing departments will also reduce the need for buyers.

Retail and wholesale buyers may specialize in products through experience or product-related training courses. Experienced buyers may advance by moving to a department that manages a larger volume or by becoming a merchandise manager.

An experienced buyer may become an assistant purchasing manager in charge of a group of purchasing professionals before advancing to retail trade manager, sales, marketing and advertising manager or supply manager. At the top levels, duties may overlap into other management functions, such as production and planning.

In high-technology manufacturing firms continuing education is essential for advancement.

Additional Information

Purchasing Management Association of Canada
http://www.pmac.ca

Related Occupations

- purchasing agents and officers (1225)

Chefs and Cooks

NOC 624

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	24,440	30,480	39,340

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
8,860	2,980	11,840

Annual Growth 1998-2008	2.6%

Main Industries of Employment

Accommodation and Food Services	82%
Other Health and Social Services	5%
Hospitals	3%

Employment by Region

Lower Mainland	53%
Vancouver Island	20%
Northern B.C.	9%
Okanagan/Kootenay	17%

Self-employment	7%

Nature of the Work

This unit group includes various types of *chefs* who plan and direct food preparation and cooking activities and who prepare and cook meals and specialty foods. They are employed in restaurants, hotels, hospitals and other health care institutions, central food commissaries, catering companies, ships, clubs, resorts, lodges and similar establishments.

Cooks prepare and cook a wide variety of foods. They are employed in the same establishments that employ chefs as well as at construction and logging camp sites. Apprentice cooks are included in this unit group.

Main Duties

Executive chefs plan and direct food preparation and cooking activities for several restaurants in an establishment, restaurant chains, hospitals or other establishments with food services.

They plan menus, ensure food meets quality standards, estimate food requirements and may estimate food and labour costs. They also supervise activities of sous-chefs, specialist chefs, chefs and cooks. They recruit and hire staff, and they may prepare and cook food on a regular basis or for special guests or functions.

Sous-chefs supervise activities of specialist chefs, chefs, cooks and other kitchen workers, and they demonstrate new cooking techniques and new equipment to cooking staff. They may plan menus, requisition food and kitchen supplies, and they may prepare and cook meals and specialty foods.

Chefs and *specialist chefs* prepare and cook complete meals, banquets or specialty foods, such as pastries, sauces, soups, salads, vegetables, meat, poultry and fish dishes, and create decorative food displays. They instruct cooks in preparation, cooking, garnishing and presentation of food, and they supervise cooks and other kitchen staff. They may plan menus as well as requisition food and kitchen supplies.

Cooks prepare and cook complete meals or individual dishes and foods, and they prepare and cook special meals for patients as instructed by a dietitian or chef. They supervise kitchen helpers and oversee subordinate personnel in preparation, cooking and handling of food. They may also plan menus, determine size of food portions and estimate food requirements and costs, as well as monitor and order supplies.

©Stone/Vancouver

Example Titles

chefs (6241):

- saucier
- chef de partie
- corporate chef
- specialist chef
- executive sous-chef
- sous-chef
- head chef
- chef de cuisine
- pastry chef
- garde manger, chef

cooks (6242):

- dietary cook
- short order cook
- hospital cook
- first cook
- journeyman/woman cook
- grill cook
- second cook
- apprentice cook
- line cook

Education and Training

While it is possible to find employment as a *chef* or *cook* without completion of high school, most people in this field have completed secondary school as well as a college program in cooking and/or a three-year cook apprenticeship. In some cases several years' experience in commercial cooking or equivalent training, possibly abroad, is sufficient. Generally, those who have training have an advantage when looking for jobs in large restaurants and hotels where hiring standards are high.

Recommended prerequisite education for apprentices is grade 10 or equivalent, with English, mathematics and science, although most employers prefer applicants with grade 12. Apprentices learn to use a wide range of kitchen tools and equipment to measure, mix and prepare everything from salads to casseroles. They also learn various cooking methods and timing skills, and training in personal hygiene and sanitation standards is often received. The apprenticeship includes technical training for three weeks each year at Camosun College, Okanagan University College or Vancouver Community College (VCC). Completion of an entry-level training program may confer credit towards some of the required technical training. Upon completion of the apprenticeship, an apprentice must pass an interprovincial standards examination to receive a Certificate of Qualification with an interprovincial Red Seal endorsement.

For people who have worked for a long time as a cook but have never completed an apprenticeship, a Certificate of Qualification is available. The certificate is awarded following submission of evidence of four and one-half years' full-time experience in the trade plus successful completion of an exam. Current details regarding this apprenticeship can be obtained by contacting a local apprenticeship office.

Many B.C. colleges and university colleges offer cooking or culinary arts training programs that take about one year to complete and prepare students for entry-level work in the trade or entry into apprenticeship. The institutions currently offering this training include Camosun College, College of New Caledonia, College of the Rockies, Malaspina University College, Northern Lights College, North Island College, Northwest Community College, Okanagan University College, Selkirk College, University College of the Cariboo and VCC.

VCC also offers a six-month certificate in Asian culinary arts and a three-month part-time certificate in Vietnamese cuisine. VCC and Okanagan University College offer programs that combine cook training with learning English as a Second Language. Admission requirements to these programs vary, but generally applicants must be at least 17 or 18 years of age and in good health, with completion of grade 10, Food Safe Level 1 and good English and math skills. Recent relevant work experience is an asset. Northwest Community College and University College of the Cariboo offer cook upgrading programs designed for those already working in the industry. Lengths of these programs vary depending on the particular curriculum chosen.

About eight to fifteen years as a cook is required to become a fully qualified chef. Those who gain experience, including in a supervisory capacity, may become executive chefs with responsibility for more than one kitchen. Cooks and chefs must be well-organized, self-disciplined and able to work quickly and carefully as well as safely. They must be able to read and follow recipes easily. They must have a keen sense of taste and smell, good hand-eye coordination and artistic creativity. They must be able to stand for long periods of time and to work in hot and humid environments. They must be courteous, tactful, patient, calm and flexible. In addition, chefs must be able to plan and direct activities involving food service and supervise and train staff. Executive chefs must have the ability and maturity to oversee activities in several restaurants at once. They must acquire math, business and supervisory skills and a knowledge of health and safety issues. Comfort with computers can be important. Generally, cooks and chefs must be prepared to work irregular hours.

Working Conditions

Chefs and *cooks* are on their feet for long periods and often work evenings, weekends and holidays. Their work environment is usually determined by the kind of establishment that employs them. The larger restaurants and expensive hotels tend to have modern equipment, convenient work areas and air conditioning. Older, smaller eating establishments may not provide the same level of comfort in the work settings for their kitchen staff.

Chefs and cooks need to be able to function in close quarters during busy periods, lift heavy objects and work near hot ovens and grills. While the kitchen staff of hotels and restaurants can expect evening and weekend shifts, cafeteria cooks in schools, factories and other institutions are more likely to have conventional work schedules. Seasonal work is often required for those working as a cook in a school or in a resort. Some cooks who have seasonal work with industries such as mining or road construction must be able to work under adverse weather and environmental conditions.

In 1995 the average annual earnings for all workers in this occupational group were $15,600 ($22,900 for chefs), but the 38% who worked full time for the full year (54% of all chefs) received an average of $22,000 in earnings ($27,200 for chefs). The respective all-occupation averages were $27,900 and $39,400. The earnings for this occupational group are generally much lower than the all-occupation averages due to the large numbers that work part time and/or part year.

A recent study found that those individuals who graduated as chefs earned on average $1,680 per month for full-time work. Entry-level cooks earned on average $1,420 per month for full-time work.

This is a very large occupational group, with much faster than average growth. The number of employed workers rose from 24,440 in 1990 to 30,480 in 1998, and faster than average growth is expected to continue in the future. Cooks account for 88% of this group.

Neither chefs nor cooks have high rates of self-employment. The rate of self-employment for the whole group is 7%, compared to the provincial average of 15%. About 28% of the group work part time, but that arrangement is less likely for chefs (10%). Younger cooks and chefs have a greater share of part-time work, while older cooks and chefs have a greater share of full-time jobs that last all year round.

The unemployment rate is about the same as the all-occupation average, and there is a higher proportion of this group that is employed for only part of the year. This reflects the seasonal nature of this occupation and the large number of cooks who lack the advanced skills needed for an increasingly competitive job market. The situation is somewhat better for chefs for whom the rate of unemployment is about the same as the all-occupation average. The proportion of chefs who work only part of the year is also about the same as the all-occupation average.

About 82% of cooks and 86% of chefs work in the accommodation and food services industry. The remainder work in industries such as health and social services, hospitals, retail trade and a variety of other industries.

Most of these workers are located in the Lower Mainland (53%), Vancouver Island (20%), the Okanagan/Kootenay (17%) and Northern B.C., although a higher proportion of chefs are located in the Lower Mainland (67%).

The proportion of women among cooks (45%) is close to their representation in the all-occupation average, but they account for only 18% of chefs. Many fast-food outlets employ young people as cooks, which is reflected in the very high proportion of workers in this group aged 15 to 24 (27%). This is almost double the proportion that this age group accounts for in the all-occupation average. For chefs the largest age concentration is found in the 25 to 34 age group, reflecting the greater level of skill and experience and time needed to become a chef.

Employment Prospects

This is a very large occupational group, made up of about 30,480 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment for this group to grow at a rate of 2.6%, much faster than the average for all occupations. According to this projection, 11,840 positions will become available from 1998 to 2008. The majority of these openings will result from growth in the number of new jobs (75%), and the remainder will result from the replacement of retired workers. Strenuous work and hours, coupled with low pay, will result in many additional openings due to a high rate of worker turnover.

Rapid employment growth in the accommodation and food services industry, which employs almost all *chefs* and *cooks* (over 80% in 1998), accounts for most of these projected openings. There are a number of factors driving growth in this industry. Increases in the number of double income families have led to both higher incomes and less time available to prepare meals at home. These factors have contributed to families eating out more frequently. A rapidly growing tourism sector is also contributing to growth in this industry. According to Tourism B.C, nearly twenty-two million overnight visitors who visited B.C. in 1998 spent $8.8 billion, an increase of 3.5% from 1997. The weak Canadian dollar is expected to attract a growing number of U.S. and European tourists to B.C. Canadian travelers will also have an added incentive to travel domestically, and B.C. is a popular tourist destination in Canada. According to industry sources, in 1999 about 8.5% more tourists came to B.C. on cruise ships than in 1998, and 75% of these tourists deemed eating in restaurants as a favourite activity.

Roughly 88% of all workers in this occupational group were cooks, and the remaining 12% were chefs, in 1998. Employment for chefs is expected to grow at around the same rate as the employment for cooks. However, due to the relative sizes of these two groups, 10,350 openings are projected to become available for cooks, and only 1,490 are projected for chefs. A higher rate of worker turnover among cooks will further increase the gap between the numbers of openings that become available for cooks and chefs.

Prospects of obtaining work vary depending on training, skills and the type of establishment. At higher skill levels demand is strong, and few highly qualified chefs are ever unemployed. Cooks who have trade qualifications or good experience will also find it easy to obtain employment. However, many positions for cooks are seasonal or part time, with workers experiencing periods of unemployment. In addition, vacancies for chefs and cooks in some ethnic restaurants are sometimes filled through immigration because of the need for unique skill sets.

With locally-based chefs winning internationally recognized awards, B.C. has been developing a growing reputation for its culinary offerings. As a result, more advanced skills are being called for by this more sophisticated end of the industry. Further, more skills are generally needed for an increasingly competitive job market. Growing consumer preference for restaurants that offer both value and high-quality or exotic foods has the industry looking for workers who are more highly-skilled and who have experience in a wider range of tasks. Demand will be particularly strong among executive chefs who are capable of managing complex establishments, have experience in human resources and can work with high-tech computer software programs.

Many of the employment opportunities for highly-skilled chefs and cooks are concentrated in popular visitor destinations, such as Vancouver, Victoria and Whistler. The prospects for higher-paying, full-time, year-round career positions will be best for cooks and chefs who have developed skills in sophisticated food preparation and presentation.

There is some mobility among the various types of chefs in this occupational group. The chef is generally considered a management-level position that not only has the responsibility for running the kitchen but also must deal with accounting, human resources, and other managerial duties. Executive chefs can progress to even higher-level managerial positions in food preparation establishments. There is also mobility among the various types of cooks. Progression to supervisory or more senior positions, such as chef, is possible with training and experience. Red Seal trade certification assists in interprovincial mobility.

Additional Information

Industry Training and Apprenticeship Commission
http://www.itac.gov.bc.ca

Related Occupations

- food service counter attendants and food preparers (in 664 food counter attendants and kitchen helpers)

Butchers and Meat Cutters, Retail and Wholesale

NOC 6251

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	2,750	2,610	2,470

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
-140	360	220

Annual Growth 1998-2008 -0.5%

Main Industries of Employment

Retail Trade	95%
Wholesale Trade	3%
Other Food Processing Industries	1%

Employment by Region

Lower Mainland	52%
Vancouver Island	22%
Northern B.C.	9%
Okanagan/Kootenay	17%

Self-employment 5%

Nature of the Work

Butchers and *meat cutters, retail* and *wholesale*, prepare standard cuts of meat, poultry, fish and shellfish for sale in various food establishments. They are employed in supermarkets, grocery stores, butcher shops, fish stores and in fish and meat wholesale plants. They may be self-employed. Butchers who are supervisors or heads of departments are included in this occupational group.

Note that the term "butcher" is being replaced by the term "meat cutter" in most instances.

Main Duties

Butchers and *meat cutters* have to cut, trim and otherwise prepare standard cuts of meat, poultry, fish and shellfish for sale at self-serve counters. They may also work according to customers' orders. Butchers and meat cutters shape, lace and tie roasts and other meats, poultry or fish and may wrap prepared meats, poultry, fish and shellfish. In addition they grind meats and slice cooked meats using powered grinders and slicing machines. In the retail setting they prepare special displays of meat, poultry, fish and shellfish. They may supervise other butchers or meat cutters.

Example Titles

- supermarket meat cutter
- meat cutter, retail and wholesale
- apprentice meat cutter
- butcher, retail and wholesale (older term)

Education and Training

There are no specific educational requirements for these workers, although completion of high school is usually necessary. Completion of several years of on-the-job training under the supervision of an experienced worker may be possible, but completion of a program at a college or technical institute or a three-year meat cutter apprenticeship is common.

Minimum education prior to entering the apprenticeship is grade 10 or equivalent, including English, mathematics and science, although grade 12 is recommended. The apprenticeship includes two technical training periods at Vancouver Community College (VCC). Completion of an entry-level training program may confer credit towards some of the required technical training. Those who complete the apprenticeship receive a Certificate of Qualification. Current details regarding this apprenticeship can be obtained by contacting a local apprenticeship office.

VCC and University College of the Cariboo (UCC) offer programs in Retail Meat Processing and Meat Cutting. The VCC program is six months in duration and can be followed by a three-month program in sausage making and smoked meats. The UCC program is nine months in duration. Admission requirements to both programs include grade 10, with grade 12 recommended. Graduates may look for entry-level employment in the trade, or they may seek an apprenticeship.

Meat cutter apprentices learn to set up, operate and maintain power equipment for preparing standard and specialty cuts of meat, fish and poultry. They also learn proper manual and machine cutting techniques and receive training in personal hygiene and sanitation standards.

Workers in these jobs need strength, good hand-eye coordination, depth perception, colour vision and manual dexterity. They should be willing to work in cool and humid areas permeated by meat odours and to work with sharp tools that may cause injuries. A good understanding of cleanliness and safety procedures is important. Comfort with computerized equipment may be necessary. Good communication and interpersonal skills are generally required.

Working Conditions

In meat packing plants and in larger food retail outlets, *butchers* and *meat cutters* generally work in large rooms equipped with power machines and conveyors. In small retail markets they work in a space behind the meat counter. These work areas must be kept clean and sanitary in order to avoid viral and bacterial infections.

Butchers and meat cutters often work in rooms that are refrigerated to prevent meat from spoiling and that are damp from blood and fat. The cold temperatures combined with having to stand for long periods can make this work tiring.

These workers can be susceptible to injuries from working with knives, cleavers and power tools. The repetitive nature of their duties can also lead to muscle pains and cumulative trauma disorders. To address these occupational risks, many employers have adjusted work loads and redesigned tasks and tools and have made efforts to increase awareness of early physical symptoms.

The incomes of butchers and meat cutters are somewhat lower than the all-occupation average. In 1995 the average annual earnings in these occupations were $27,600, which was very close to the average over the whole labour market ($27,900). For those working full time, full year, the average annual earnings were $34,300, about 15% below the average for all occupations. According to industry sources, entry-level earnings for full-time meat cutters range from $24,000 per year to $34,800. For experienced, qualified meat cutters, full-time annual earnings range from $27,000 to $43,200. According to a recent graduate survey, entry-level workers in this field earned an average $1,790 per month for full-time work. This translates into approximately $21,500 for full-time, full-year work, somewhat less than incomes reported by industry sources.

This is a medium-sized occupational group, with an estimated 2,750 workers in 1990. This occupation declined to 2,610 in 1998. This group is projected to experience continued negative growth for the next several years up to 2008. Industry sources believe that the true number of retail and wholesale meat cutters is now less than 2,000 as businesses move the operation back to the manufacturing sector.

Self-employment is still rare among butchers and meat cutters. Only 5% of them are self-employed, compared to the B.C. average of 15%. However, industry sources expect self-employment to increase in importance. Part-time workers account for 22% of all butchers and meat cutters, somewhat below the average of 26% across the entire labour market. Industry sources predict that the percentage of part-time work will also increase. These occupations have an unemployment rate that is the same as the average for all occupations.

Seasonal patterns of holidays undoubtedly affect the hours of work in certain weeks for butchers and meat cutters. The major seasonal pattern in this trade is a slow-down in work during January and February, when consumer spending is low after the holiday season.

Over 95% of all butchers and meat cutters are employed in retail trade. Only 3% work in wholesale trade, and the remainder are employed in food-related services.

Butchers and meat cutters are employed in regions of B.C. in nearly the same proportion as the total workforce. Just over half are in the Lower Mainland, 22% are on Vancouver Island, 17% are in the Okanagan/Kootenay, and 9% are in Northern B.C.

These are largely but not exclusively male occupations, with only about 25% of the employees being women. This compares to a 46% representation for women in the overall labour force.

At 37 years, the average age of butchers and meat cutters is just below the average B.C. worker (38). There is a slight overrepresentation of the 35 to 44 year old group in these occupations.

Employment Prospects

This is a medium-sized occupational group, made up of about 2,610 workers in B.C. in 1998. Projections from the Canadian Occupation Projection System (COPS) call for a decline in employment of 0.5% per year from 1998 through to 2008. This means that by 2008, total employment for this group will decline by 140 people. Despite a decline in net employment, there are expected to be 360 openings from the need to replace workers who retire.

The trend has been for major employers of *butchers* and *meat cutters* to reduce the number of jobs, and to cut wages of remaining workers in British Columbia. This trend has occurred during a period when the growing amount of "retail-ready" cuts being shipped into B.C. from the United States and Alberta is outpacing the growing demand for meat products associated with a growing population. Another big impact on employment opportunities is the increasing demand for pre-prepared and ready-to-heat packaged foods.

According to industry sources, "meat plants" (facilities that butcher live-stock and ship animal parts to supermarkets and other retailers to be further butchered) are cutting meat into smaller pieces than ever before. Note that there are few of these "meat plants" in B.C.

Retailers still need to cut meat into retail-ready cuts, but there is less cutting involved. This is partly responsible for the large reduction in the demand for butchers and meat cutters in retail outlets and the slight increase in meat plants. Employment increases in meat plants have not matched the employment reductions in retail outlets due to the greater potential for worker specialization and mechanization in meat plants. According to industry sources, there are only a few small meat plants located in B.C., and these plants hire mainly machine operators and very few butchers and meat cutters.

Although overall employment for retail outlets is on the decline, there are a growing number of smaller butcher shops that cater to the growing demand for specialty meats. This may be a source of some employment growth for this occupational group. Industry sources expect this trend to continue through to 2008.

One factor that may ease the difficulty of finding work in this group is the limited supply of qualified workers. According to industry sources, most qualified butchers and meat cutters are able to find full-time jobs.

Additional Information

Industry Training and Apprenticeship Commission
http://www.itac.gov.bc.ca

Related Occupations

- industrial butchers and meat cutters, poultry preparers and related workers (included in 946, machine operators and related workers in food, beverage and tobacco processing)

Bakers

NOC 6252

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	4,290	4,620	5,140

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
520	710	1,230

Annual Growth 1998-2008 1.1%

Main Industries of Employment

Retail Trade	66%
Accommodation and Food Services	18%
Other Food Processing Industries	14%

Employment by Region

Lower Mainland	58%
Vancouver Island	18%
Northern B.C.	9%
Okanagan/Kootenay	15%

Self-employment 10%

Nature of the Work

Bakers prepare bread, rolls, muffins, pies and cakes for sale in retail food establishments or for serving in restaurants and other establishments. They are employed in bakeries, supermarkets, hotels and restaurants. They may be self-employed. Bakers who supervise others are included in this occupational group.

Main Duties

A *baker* prepares dough for pies, bread, rolls and sweet goods and also prepares batters for muffins, cookies, cakes, icings and frostings. They work according to recipes or special customer orders. They bake mixed doughs and batters, and frost and decorate cakes or other baked goods.

Bakers have to draw up production schedules to determine the type and quantity of goods to produce. They also purchase baking supplies. In some cases, they hire and train baking personnel and oversee sales and merchandising of baked goods.

Example Titles

- baker
- apprentice baker
- bakery supervisor
- head baker

©Stone/Vancouver

Education and Training

Completion of secondary school as well as a college program and/or a three-year apprenticeship in baking is usual for those entering this field. On-the-job training may be provided.

Minimum education prior to starting an apprenticeship is grade 10 or equivalent, including English, mathematics and science, although grade 12 is preferred. Apprentices learn to use specialty equipment to measure, mix and prepare a variety of ingredients for baking and baked-goods decorating. Students also learn to use a baking oven by setting thermostatic controls and adjusting drafts. Training in personal hygiene and sanitation standards is also received. Three terms of technical training at Vancouver Community College (VCC) are included. Upon completion of the apprenticeship, an apprentice must pass an interprovincial standards examination to receive a Certificate of Qualification with an interprovincial Red Seal endorsement.

For people who have worked for a long time in this trade but have never completed an apprenticeship, a Certificate of Qualification is available. The certificate is awarded following submission of evidence of four and one-half years' full-time experience in the trade plus successful completion of an exam. Current details regarding this apprenticeship can be obtained by contacting a local apprenticeship office.

Many B.C. colleges and university colleges offer cooking or culinary arts training programs that take about one year to complete and prepare students for entry-level work in the trade or entry into apprenticeship. For a review of the institutions with general culinary arts programs see the profile for Chefs and Cooks (624).

A ten-month program in baking and pastry arts is available at VCC, and graduates may find employment or seek out an apprenticeship. The College also offers a seven-month certificate for baking assistants, which is designed to include development of English as a Second Language. Malaspina University College offers a ten-month commercial baking program. Graduates may obtain work as bakers' helpers, seek an apprenticeship or continue with further training. A Baking and Pastry Upgrade course is available at VCC for those who have at least one year of experience or training in cooking or baking. The program length varies between one and four months depending on the specialty chosen.

Bakers need basic analytical skills, and they must be able to read recipes, schedule production and communicate effectively with staff and customers. Supervision skills, knowledge of computerized equipment and developing technology, and an ability to develop niche markets may also be necessary.

Working Conditions

Bakers work in hot, steam-filled work areas in which they must exercise caution and judgment in order to avoid accidents and injuries. Their work schedule usually involves early morning hours so that fresh baked goods are ready for retail by usual business hours.

Bakers earn incomes that are substantially lower than average. In 1995 the annual average earnings for all workers in this occupation was $20,400. Those who worked full time for the whole year (49%) earned an average of only $26,900. The comparable figures for all occupations in the province were $27,900 and $39,400. According to a survey of recent college graduates, those who found work as bakers reported an average income of $1,480 per month ($17,700 per year).

Bakers are a medium-sized occupational group, with an estimated 4,620 workers in 1998. Employment in this field increased by only 8% from 1990 to 1998. About 10% of bakers are running their own businesses, which is a little lower than the level of self-employment for all occupations (15%). The mix of full-time and part-time work for this occupation is reasonably close to that for the workforce as a whole. About 78% of bakers work full time, and 22% work part time.

Bakers experience unemployment at about the same rate as the average for all occupations. While baking is affected by seasonal pressures around holidays when more working hours are required, it is not a seasonal job in the traditional sense.

The largest source of work for bakers is the retail trade, which employs 66% of the workers in this field. The other important employers are accommodation and food services, where 18% of all bakers find their work, and other food processing industries, which employ 14% of this group. The geographic distribution of workers is similar to that for all occupations. About 58% of the workers are located in the Lower Mainland, 18% are on Vancouver Island, 15% are in the Okanagan/Kootenay region, and 9% are in Northern B.C.

Women are represented among bakers at 40%, which is slightly less than the provincial average (46%) for all occupations. Men who work as bakers tend to have full-time positions (86% of men hold full-time jobs). In contrast, about two-thirds (67%) of the women who work as bakers have full-time positions, and one-third (33%) hold part-time jobs. In addition, men in full-time, full-year positions earn substantially more than women. The average earnings for full-time, full-year work as bakers is $29,900 for men, compared to only $20,100 for women.

At 36 years, the average age of bakers is slightly younger than the average age (38) for all occupations. There is a higher percentage of bakers in the 15 to 34 age group (52%) compared to the workforce as a whole (40%).

Employment Prospects

This is a medium-sized occupational group, made up of about 4,620 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment for this group to grow at an annual rate of 1.1%, more slowly than the average for all occupations. According to this projection, 1,230 positions will become available from 1998 to 2008. The majority of these openings (60%) will result from the replacement of retired workers, and the remainder will result from growth in the number of new jobs. Some additional openings will become available from worker turnover.

Baking is a well-established field. Like many consumer products and personal services fields, demand for bakers increases in a direct relationship with population growth but is also strongly affected by consumer preferences. Fitness and health concerns may reduce sales of pastries and increase the sales of certain speciality or health breads. Industry sources have also indicated that increased immigration, and the evolving tastes that it has brought about, has caused a growing demand for specialty bakery goods. In response to evolving consumer preferences, bread products are becoming more diversified, and many more are prepared closer to the point of sale. Larger supermarkets are making room for on-site bakeries and can increase store profits by producing custom bakery goods.

According to industry sources, most openings for *bakers* will be in smaller bakeries due to mechanization in factories, where fewer bakers will be needed, and the growing number of smaller bakeries that sell specialty bakery goods. These bakeries have a smaller capacity for mechanization and are also very reluctant to compromise quality by using pre-mixed supplies that would reduce labour costs.

The Red Seal trade certification allows for interprovincial mobility and will continue to ensure competition for openings in this field from individuals from other provinces. However, according to industry sources, employers find it difficult to find higher skilled bakers. The best opportunities will be for those who are able to work in bakeries that cater to the increasingly diversified consumer demand for high-quality specialty bakery goods. The growing number of smaller bakeries and self-employment in this field will also ensure good opportunities for those who can successfully operate a small business.

Additional Information

Industry Training and Apprenticeship Commission
http://www.itac.gov.bc.ca

Related Occupations

- baking machine operators (included in 946, machine operators and related workers in food, beverage and tobacco processing)
- pastry chefs (included in 624 chefs and cooks)

Police Officers (Except Commissioned)

NOC 6261

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	5,990	6,140	6,920

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
780	2,130	2,910

Annual Growth 1998-2008 1.2%

Main Industries of Employment

Federal Administration	64%
Local and Other Administration	33%
Provincial and Territorial Administration	1%

Employment by Region

Lower Mainland	60%
Vancouver Island	16%
Northern B.C.	10%
Okanagan/Kootenay	14%

Self-employment 0%

Nature of the Work

Police officers protect the public, detect and prevent crime and perform other activities directed at maintaining law and order. They are employed by municipal and federal governments, some provincial governments and the Armed Forces. This occupational group includes military and railway police.

Main Duties

Police officers patrol assigned areas in vehicles, on bicycles and on foot to maintain public safety and order and to enforce laws and regulations. They investigate crimes and accidents. They secure evidence, interview witnesses, compile notes and reports, and provide testimony in courts of law. They arrest criminal suspects and execute warrants. Like firefighters, they also provide emergency assistance to victims of accidents, crimes and natural disasters.

Police officers participate in crime prevention programs and in public information and safety programs. At higher ranks, they may supervise and coordinate the work of other police officers.

Example Titles

- military police officer
- crime prevention constable
- railway police officer
- police sergeant
- waterfront police officer
- police officer
- police cadet
- RCMP officer
- constable
- police diver
- community relations officer
- detective
- highway police officer

Education and Training

Requirements vary between departments, but grade 12 or equivalent is usually required for *police officers*, and a certificate, diploma or degree in law, security, criminology or criminal justice or in the social sciences may be an asset or a requirement. Recruits usually must be at least 19 years old, a Canadian citizen and able to swim, with normal hearing and vision, a driver's licence and no criminal record. Physical fitness and emotional stability are required. Training programs are generally provided by the employer.

Students at Camosun College can receive an associate of arts degree specializing in criminal justice or a diploma in criminal justice following two years of study. One-year certificate programs and two-year diploma programs in this field are offered by Douglas College (criminal justice) and Kwantlen University College (criminology). Langara College has a two-year program in criminal justice. The College of New Caledonia and Malaspina University College both have two-year diploma programs in criminology. Graduates of these programs can receive up to two years of university block transfer credit. Capilano College offers criminology courses that can be transferred to Simon Fraser University's (SFU) criminology program.

University College of the Fraser Valley offers both a two-year diploma program in criminology/criminal justice and a four-year bachelor's degree in arts, specializing in criminal justice. The School of Criminology at SFU offers a bachelor's degree in arts with a major in criminology, using a comprehensive, interdisciplinary approach. This degree is also available through the Open University by distance education. Students at SFU can also undertake a bachelor's degree with a joint major in psychology and criminology. As well, SFU offers one-year general and advanced certificate programs in criminology. Applicants to these programs generally must have completed high school and in some cases must comply with other prerequisites, such as security or medical checks or personal interviews.

The Justice Institute of B.C. offers a six-week Adult Correctional Officer Program designed for individuals interested in pursuing a career in adult supervision, security or public safety. The Institute also has a six-week Deputy Sheriff Employment Readiness Program that trains individuals for entry-level employment in sheriffs offices. The University College of the Cariboo offers a nine-month corrections program that leads to a Corrections Certificate for those interested in working with adult and youth offenders.

A post-baccalaureate diploma in criminology is available to those who have already completed a bachelor's degree in any field at the SFU campus or through the Open University by distance education.

Community policing is changing. Officers now need skills in organizing communities, planning, facilitating, lobbying and empowering people. Police officers need good judgement and a keen sense of responsibility. They should enjoy serving all kinds of people and have good oral and written communication skills. They need to be able to work as part of a team or independently and should be prepared to work shifts.

Working Conditions

Police officers perform their duties in work environments that are among the most demanding that can be found. While some of their work is conducted in stations or facilities that are reasonably comfortable (although usually plain), other tasks must be performed outdoors. This can involve working for prolonged periods in environments that are cold (or hot in summer) or wet, and workers may be on their feet extensively. These requirements necessitate physical stamina.

Police officers are in frequent contact with the general public and must be prepared to deal with potentially dangerous situations in which they or members of the public could be at risk. This occupational requirement means that they must be constantly alert and observant and exercise very good judgment and tact. In the event that they must deal with a dangerous or emergency situation, police officers need to be in good physical condition. This requires not only stamina but also agility, knowledge of self-defence and safe use of firearms. The ability to remain calm and level-headed while under pressure is vital, and the level of concentration needed is high.

Work schedules usually involve a standard number of hours per week, but the shifts may vary. Since law enforcement is conducted 24 hours a day and seven days a week, shifts may be at any hour (including evenings and early hours of the morning) and on any day (including weekends and holidays). All these occupational requirements make police officers susceptible to stress-related problems. It is important for officers to be aware of these potential difficulties and to take steps to prevent them or to reduce their likelihood.

Because of these occupational hazards, police officers are well paid compared to most occupations. The 1995 average annual earnings of B.C. police officers were $53,300, or 91% higher than the average for all occupations. Most police officers (81%) work full time for the whole year, and they average $55,400 in earnings. The respective all-occupation averages were $27,900 and $39,400. According to a survey of recent college graduates, those who found work as police officers earned an average of $3,360 per month ($40,300 per year).

This is a large occupational group, with an estimated 1998 employment of 6,140 workers. Despite substantial growth in the population, the number of police officers has only increased by 3% from 1990 to 1998. No people in this occupation reported being self-employed in the 1996 Census, and at 2%, police officers have one of the lowest percentages of part-time workers of any occupation.

The highly structured recruiting and other employment practices cause the unemployment rate to be lower than the average for all occupations. About 98% of all police officers work full time, and 17% work full time for only part of the year. There are some seasonal demands in this work that affect hours and shifts more than overall staffing levels.

For all practical purposes police only work in the government sector. In addition, a few are employed in transportation and other public places, such as hotels, but the numbers involved are small. The RCMP is responsible for most provincial and local policing, and they account for 64% of police officers. About 33% work for local government. The statistics indicate that the provincial government accounts for only 1% of these workers.

The geographic distribution of workers is close to the average for all occupations. About 60% are located in the Lower Mainland, 16% are on Vancouver Island, 14% are in the Okanagan/Kootenay region, and 10% are in Northern B.C.

Only 15% of police officers are women. Many police forces now are recruiting women actively in an attempt to increase their representation. There are hardly any police officers under 25 years of age (2%), and 74% of the workers are in the 25 to 44 age group, compared to 53% for the workforce as a whole. This reflects the physical demands of the job and the need for maturity in police officers. The average age is 38.

Employment Prospects

This is a large occupational group, made up of about 6,140 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment for this group to grow at an annual rate of 1.2%, slower than the average for all occupations. According to this projection, 2,910 positions will become available from 1998 to 2008. The majority of these openings (73%) will result from the replacement of workers who retire, and the remainder will result from growth in the number of new jobs.

This is a purely public service field, dependent on government spending policies, population growth and other trends related to the need for police officers, such as the crime rate. Government fiscal restraints will considerably dampen the growth in opportunities for *police officers* that would otherwise have occurred because of B.C.'s growing population.

A major area of uncertainty in assessing the prospects for this occupation relates to B.C.'s higher than average crime rates and lower than average rates of crimes being solved. If the public or policy makers decide that these differences in B.C.'s public safety record require a solution, then the amount of government funding devoted to policing may increase.

According to industry sources, there is currently a shortage of police officers in B.C. This shortage is partly because of budget constraints and also because of difficulty finding qualified women and visible minority applicants. The Vancouver City Police Department is currently recruiting constables from visible minority communities in order to bring the force into closer alignment with community demographics.

The most important organizational factor for police careers is the distinction between the RCMP and the independent municipal forces. In B.C. there is a provincial RCMP force with 123 local units, 55 RCMP municipal forces and 12 independent municipal forces. An RCMP federal force, CN and CP railway police are also present in the province, though the ports police have been disbanded.

The combined federal and administrative RCMP forces employ nearly 1,000 officers. The RCMP provincial forces employ 1,500, and the municipal detachments employ 2,300. The 12 independent local police forces employ over 2000 officers. Because of the lower salaries paid to Mounties, few municipalities are likely to change from RCMP to their own forces during this period of government restraint. There has been no indication of a revival of the long-defunct B.C. Provincial Police, similar to the Ontario Provincial Police or the Sûreté du Québec.

For police officers a career progression to commissioned police officer positions is possible with additional training and experience. Promotions or pay increases in the future will probably require more education. At present a university degree is preferred for entrants who are intending to develop a career in this field. RCMP officers may have opportunities for geographic mobility.

Additional Information

Justice Institute of B.C. http://www.jibc.bc.ca

Related Occupations

- by-law enforcement and other regulatory officers, n.e.c. (included in 646, other occupations in protective service)
- commissioned police officers (included in 01/09 middle and other management)
- sheriffs and bailiffs (included in 646, other occupations in protective service)
- private detectives (included in 646, other protective service occupations)

Firefighters

NOC 6262

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	2,580	3,380	3,740

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
360	1,170	1,530

Annual Growth 1998-2008	1.0%
Main Industries of Employment	
Local and Other Administration	91%
Federal Administration	5%
Non-Ferrous Manufacturing	1%
Employment by Region	
Lower Mainland	65%
Vancouver Island	14%
Northern B.C.	7%
Okanagan/Kootenay	13%
Self-employment	0%

Nature of the Work

Firefighters carry out firefighting and fire prevention activities and assist in other emergencies. They are employed by municipal, provincial and federal governments, as well as by large industrial establishments that have internal firefighting services.

Main Duties

Firefighters must respond to fire alarms and other calls for assistance, such as automobile and industrial accidents. Once on the scene, their first task is to rescue victims from burning buildings and accident sites. Firefighters are trained to administer first aid and other assistance to fire and accident victims. If a fire is burning, they control and extinguish the fire using manual and power equipment, such as axes, water hoses, aerial ladders and hydraulic equipment.

Firefighters ensure the proper operation and maintenance of their firefighting equipment through routine drills. They also inform and educate the public on fire prevention. They may supervise and coordinate the work of other firefighters. Because of the nature of their work, they must train to maintain high levels of physical fitness.

Example Titles

- lieutenant, firefighter
- firefighter, shipboard
- industrial firefighter
- airport firefighter
- firefighter
- fire captain

Education and Training

The minimum education required to be a *firefighter* is usually grade 12, and preference may be given to applicants who are graduates of college courses in fire prevention and safety. There is usually formal training provided by the employer, and recruits typically undergo a period of probation.

The Justice Institute of B.C., through its Fire Academy, trains both volunteer and industrial firefighters in the field and in the classroom. The Institute offers courses in fire safety, basic fire science and mathematics as they relate to the profession. The Open University, in cooperation with the Justice Institute, offers a Fire Services Diploma, which combines fire services courses with liberal arts courses. Although these programs do not guarantee employment, they are assets. In recent years education and pre-employment training have become even more important.

Personal requirements for firefighters are not standardized, but they typically include physical strength, agility, fitness, good vision and possession of a valid driver's licence. Height, weight and other requirements vary, so those interested should check with the department they are interested in joining. Firefighters require mental alertness, courage and good judgement. Because they eat, sleep and work closely together under stressful conditions, people in this profession also need to be able to communicate well and get along with others. They must be able to work as part of a team. A knowledge of first aid and mechanics can be an asset or even a requirement. Training or experience in the operation of heavy equipment, possession of special driving licences and an ability to swim may all be assets.

For a description of programs in criminal justice/criminology see the profile for Police Officers (6261).

Working Conditions

Firefighters spend much of their time in fire halls or training facilities preparing for various emergency situations. When emergencies arise, firefighters must be able to respond immediately. At the scene of the emergency, firefighters have to remain calm and level-headed and help to calm other people as well. They often need to put themselves physically at risk in order to deal with the situation. The duties of this occupation mean that firefighters must have a very high level of physical fitness as well as the ability and access to resources to deal with possible emotional stress.

Firefighters are among the better paid occupations. The 1995 average annual earnings for this occupation were $51,700, which is 85% higher than the all-occupation average of $27,900. Firefighters who work full time for the whole year (82%) earned an average of $53,300, also well above the provincial average of $39,400. According to a survey of recent college graduates, those who found work in this occupation earned an average of $3,380 per month ($40,500 per year).

This is a medium-sized occupational group, with the number of employed workers estimated at 3,380 in 1998. This group grew by 800 workers (31%) between 1990 and 1998.

The work involved is a public service, and as such, self-employment is non-existent in this occupation. Only 2% of firefighters work part time, one of the lowest percentages of any occupation.

The unemployment rate for firefighters is lower than the average for all occupations. This reflects the very structured recruiting practices in this field. About 97% of firefighters work full time, and 16% work full time for only part of the year.

Over 91% of all firefighters work for local governments. About 5% work for the federal government and about 1% for the province. There are small numbers in a variety of other industries that require firefighters for their own operations, such as air transportation.

The Lower Mainland accounts for 65% of all firefighters, compared to only 57% for all occupations. About 15% of the workers are employed on Vancouver Island, 13% are employed in the Okanagan/Kootenay region, and 7% are employed in Northern B.C.

©Stone/Vancouver

This is still an occupation dominated by men. An exceptionally low 1% of all firefighters in the province are women. The provincial average for all occupations is 46%.

Despite the serious physical demands of this job, the average age (40) of firefighters is two years older than the average age of all B.C. workers. In 1996 there were hardly any firefighters under 25 years of age (3%), but the 35 to 44 age group accounted for 43%. In fact, those workers between 35 and 54 years of age represented 72% of all firefighters, compared to only 49% for the workforce as a whole.

Employment Prospects

This is a medium-sized occupational group, made up of about 3,380 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment for this group to grow at an annual rate of 1.0%, slower than the average for all occupations. According to this projection, 1,530 positions will become available from 1998 to 2008. The majority of these openings (76%) will result from the replacement of retired workers, and the remainder will come from growth in the number of new jobs.

This is an almost purely public service occupation, and its future employment prospects depend as much on government spending policies as on growth in population and buildings. Continuing government restraints will limit the employment growth that might otherwise take place in this field because of population increases.

There are only 27 all-professional fire departments in B.C., compared to 228 all-volunteer departments and another 77 composite departments. There are also 80 small forces in industry, native bands and the federal government.

In some suburban areas, rapid population and infrastructure growth could prompt the conversion of volunteer departments to professional status, increasing the number of career firefighter positions. Conversely, amalgamations of municipalities or their services could result in job reductions due to increased efficiencies.

Competition for these employment openings is expected to remain keen through to 2008 because there are so many qualified people looking for positions in this field. According to industry sources, there is currently a surplus of qualified persons looking for employment due to a high degree of interest in this field. In addition, training programs have responded to the high interest in this field by expanding their operations and turning out even more qualified persons.

Although it is difficult to enter this field, careers are challenging and opportunities for promotion are good in most fire departments. Promotions are usually awarded on the basis of seniority, job performance, scores on a written examination and interviews. The order of promotion for firefighters is usually to engineer, lieutenant, captain, battalion chief, assistant chief, deputy chief and finally to chief. Promotions to higher level positions, such as chief, are often restricted to those with higher levels of education.

Additional Information

Justice Institute of B.C. http://www.jibc.bc.ca

Related Occupations

- fire chiefs and senior firefighting officers (0642)
- forest firefighters (included in 8422, silviculture and forestry workers)

Hairstylists and Barbers

NOC 6271

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	7,810	10,160	12,050

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
1,890	810	2,700

Annual Growth 1998-2008	1.7%
Main Industries of Employment	
Personal and Household Services	98%
Amusement and Recreation Services	1%
Accommodation and Food Services	1%
Employment by Region	
Lower Mainland	56%
Vancouver Island	18%
Northern B.C.	9%
Okanagan/Kootenay	17%
Self-employment	34%

Nature of the Work

Hairstylists and *barbers* cut and style hair and perform related services. They are employed in hairstyling or hairdressing salons, barber shops and hair replacement clinics and studios. They are also employed in vocational schools and health care establishments, as well as in theatre, film and television establishments.

Main Duties

Hairstylists perform many duties, including suggesting a hair style compatible with the client's physical features or determining a style from the client's instructions and preferences. They shampoo, rinse, cut, trim, taper, curl, wave, perm and style hair. They may also apply bleach, tint, dye or rinse to colour, frost or streak hair. Hairstylists can also analyse hair and scalp condition and provide basic treatment or advice on beauty care treatments for scalp and hair. They may also train or supervise other hairstylists, hairdressers and assistants.

Barbers cut and trim hair according to their clients' instructions or preferences. They will also shave and trim beards and moustaches. They may shampoo hair and provide other hair treatment, such as waving, straightening and tinting, and may also provide scalp conditioning massages.

Example Titles

- apprentice barber
- barber
- apprentice hairdresser
- hairdresser
- hairstylist
- hair colour technician
- wig stylist

©Stone/Vancouver

Education and Training

There are two ways to become a *hairstylist* in B.C. The first is to complete a training program in hairstyling at a private or public institution and then write a licensing exam administered by the B.C. Hairdressers' Association. The second is to complete a two-year apprenticeship sponsored by a salon and then write the licensing exam.

Prerequisite education for the apprenticeship is grade 10 or equivalent, with English, mathematics and science, but most employers prefer applicants with grade 12. Completion of an entry-level training program may confer credit towards some of the required technical training. Upon completion of the apprenticeship, an apprentice must write the Hairdressers' Interprovincial Examination prior to taking the Hairdresser's Association practical examination. Upon successful completion of both these examinations, a Certificate of Qualification with an interprovincial Red Seal endorsement and a licence to practise are issued. Current details regarding this apprenticeship can be obtained by contacting a local apprenticeship office.

Three public institutions offer programs in this field in B.C. Selkirk College offers a ten-month program in hairdressing. Applicants must be high school graduates or at least 18 years of age with grade 10. A one-year certificate in hairdressing is granted by Malaspina University College. Applicants must be at least 17 years of age with grade 10, although grade 12 is recommended. Vancouver Community College offers a 10-month program in hairstyling, which is extended to 14 months for those who wish to receive assistance with English while training. The prerequisites are completion of grade 10 or completion of the College's Lower Intermediate English, respectively. The final portion of each program allows students to specialize in either men's or women's hairstyling.

There are also two ways to become a *barber* in B.C. One approach is to apprentice with a barber for two years. Technical training is provided on site by the employer. A second option is to take a nine-month training program at a private barbering school and apprentice for one year. Prerequisites for the apprenticeship in barbering are the same as for hairdressing. Upon successful completion of the apprenticeship, apprentices receive a Certificate of Apprenticeship. They are then eligible to write the licensing examination administered by the Barbers' Association of B.C.

Hairdresser and barber apprentices learn to use a range of specialty equipment and products to assist in the treatment of hair and scalp. They receive training on sanitation, personal hygiene and massage. In some cases, training on how to give manicures and pedicures and basic business skills is included.

People in these occupations should have good stamina and manual dexterity, a creative eye and good listening and communication skills. They must have normal colour vision and good depth perception. They should enjoy working with a wide variety of people. They must be prepared to work irregular hours, with chemicals, and be on their feet for long periods of time. Basic knowledge of computers, analytical skills and flexibility are assets. Those considering eventual ownership of their own operation should be prepared to learn business and bookkeeping techniques as well as entrepreneurial and managerial skills.

Working Conditions

Hairstylists and *barbers* usually work in service outlets or salons that are clean, comfortable and well-lit. During busy hours, they must be on their feet for prolonged periods. They need to have a good ability to visualize or conceptualize in order to interpret their clients' hairstyle preferences accurately. Because they are in direct contact with clients for extended periods, it is helpful if they are comfortable engaging in conversation and have good inter-personal skills.

These workers generally work 35 to 40 hours per week. They may be required to work specific shifts if their employer's business hours include evenings or weekends.

Hairstylists and barbers earn incomes that are substantially lower than average. In 1995 their annual average earnings were only $15,700, some 44% below the average figure for all occupations ($27,900). For those who worked full time for the whole year (44%), the average earnings were $20,500. This level of earnings is 48% less than the average for all full-time, full-year workers in this province ($39,400). However, it must be remembered that these are occupations where tipping is common and may not always be fully reflected in reported earnings. According to a survey of recent college graduates, those who found work in these occupations reported earning on average $1,200 per month ($14,500 per year).

Hairstylists and barbers are a very large occupational group, with employed workers numbering 10,160 in 1998. Employment rose by 2,350 positions or 30% from 1990 to 1998. While self-employment accounts for only 15% of all workers in B.C., 34% of hairstylists and barbers are self-employed.

About 70% of those employed in these occupations work full time, and 26% work full time for only part of the year. The respective all-occupation averages are 74% and 27%. About 30% of hairstylists and barbers work on a part-time basis. This group has an unemployment rate that is lower than the average for all occupations, and there is little seasonality of employment.

Nearly all hairstylists and barbers (98%) work in the personal and household service industries.

The employment in this personal service field is spread throughout the regions of B.C. in virtually the same proportions as the overall labour force. About 56% are employed in the Lower Mainland, 18% on Vancouver Island, 17% in the Okanagan/Kootenay region and 9% in Northern B.C.

Hairstylists and barbers are occupations that are dominated by women, with 82% of the workers being women. There is a higher proportion of workers in the 25 to 34 age group (35%) than the average for all occupations (25%). The average age among hairstylists and barbers is 37, just one year younger than the average for all B.C. workers.

Employment Prospects

This is a very large occupational group, made up of about 10,160 workers in B.C. in 1998. Projections from the Canadian Occupation Projection System (COPS) call for an annual employment growth rate of 1.7%, about as fast as the average for all occupations. According to this projection, 2,700 positions will become available from 1998 to 2008. The majority of these openings (70%) will result from growth in the number of new jobs, and the remainder will result from the replacement of retired workers. Many additional openings will become available from a high rate of worker turnover.

Like many other personal service occupations, *hairstylists* and *barbers* are in growing demand as a direct result of B.C.'s growing population. Other factors also have an impact on the demand for these services. Older populations are expected to make fuller use of hairstylists and barbers. However, many families and consumers are seeing their incomes stagnate, and this could reduce spending on hair care.

According to industry sources, fashion is a way of life for many consumers, and they are demanding specialty treatment. For this reason, there is little growth in the number of full-service, unisex salons, and most job openings that become available will be for *hairstylists*.

Industry sources indicate that self-employment in these occupations is on the rise. Prospects are good for those who intend to start their own salon. New and potential salon owners need to have a good business sense. Business is usually slow at first until a stable clientele has been established through word-of-mouth and other forms of marketing.

Additional Information

Industry Training and Apprenticeship Commission
http://www.itac.gov.bc.ca

Related Occupations

- estheticians, electrologists and related occupations (6482)
- hairdressing teachers (included in 4131 college and other vocational instructors)

Funeral Directors and Embalmers

NOC 6272

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	270	360	430

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
70	30	100

Annual Growth 1998-2008	1.8%
Main Industry of Employment	
Personal and Household Services	100%
Employment by Region	
Lower Mainland	49%
Vancouver Island	17%
Northern B.C.	6%
Okanagan/Kootenay	31%
Self-employment	9%

Nature of the Work

Funeral directors meet with bereaved families and assist in coordinating and conducting all aspects of funeral services and ceremonies. This may include providing support during the emotional crises of death, giving the family information about various service and financial options available, and helping to arrange a service that is meaningful for the family.

Embalmers are entrusted to care for deceased persons with dignity and respect. These workers sanitize, preserve and restore deceased persons for visitation or transportation if required.

Funeral directors and *embalmers* are employed by licensed funeral homes.

Main Duties

Funeral directors consult with the family of the deceased regarding the nature of the service or ceremony desired, the final disposition of the remains and funeral costs. They inform survivors of death benefits and other financial assistance that may be available. *Funeral Directors* must have excellent communication and organizational skills and be caring, sensitive and respectful.

Funeral directors oversee the preparation of the remains, plan and schedule funeral services, coordinate burials and cremations, and complete legal documents. They discuss and negotiate pre-arranged funerals with clients and may also manage funeral home operations, including hiring and directing staff, maintaining financial records, preparing accounts and ordering merchandise. Funeral directors may also perform the work of embalmers.

Embalmers preserve, sanitize and prepare human remains for funeral services, performing cosmetic and restorative work in the process. The embalming process is done in a clinical or surgical environment, using a variety of embalming chemicals and instruments. Embalmers must have a thorough knowledge of diseases, health and safety regulations, anatomy, chemistry, and embalming and restoration procedures.

With the exception of a very few, most embalmers are also funeral directors.

Example Titles

- apprentice funeral director
- funeral director
- embalmer
- apprentice embalmer

Education and Training

It is mandatory to be licensed by the Ministry of Attorney General, Registrar of Cemetery and Funeral Services (the provincial licensing and regulatory body) and to be employed by a licensed funeral provider in order to practise as and use the title of *licensed funeral director* or *licensed embalmer* in the province of British Columbia, under the Cemetery and Funeral Services Act.

Those who wish to work in this area generally secure employment at a funeral home and then complete a two-year apprenticeship program, which includes on-the-job training, home study and college courses. Education required is grade 12, and biology 12 and chemistry 12 are recommended. A valid first aid certificate is also required.

The Industry Training and Apprenticeship Commission (ITAC), through the British Columbia Funeral Association, provides funeral service education programs that are designed to train individuals who are seeking to practise as embalmers and/or funeral directors in B.C. Individuals who meet entrance requirements for these programs must be employed by a full-service funeral provider under the direct supervision of a licensed practitioner in the province. The apprentice will register in one of three possible routes for trade qualification certification. These routes are embalmer and funeral director, embalmer, or funeral director.

Upon completion of the apprenticeship, apprentices receive a Certificate of Qualification from ITAC. Those who have not completed an apprenticeship but have been working in the trade for a minimum of three years may receive a Certificate of Qualification by providing proof of this employment and passing an exam. A current first aid certificate is also required.

People in this line of work must be able to communicate effectively with a wide variety of people, including health, legal and theological professionals. They should be both emotionally stable and sensitive and empathetic when interacting with bereaved persons of different cultural and religious backgrounds. They should have an eye for detail, with good coordination and organizational skills. Working hours may often be irregular and sometimes long. The work can be physically, emotionally and mentally demanding.

Working Conditions

Funeral directors and *embalmers* often work long, irregular hours. Funeral homes are usually open on evenings and weekends and, as a result, shift work is sometimes required. Hours may vary more in smaller funeral homes, though in larger ones, employees generally work 8 hours a day for 5 or 6 days a week.

Because these workers may come into contact with the remains of persons who had infectious diseases, they must follow strict health regulations. Further, out of respect and consideration for the families and the deceased, funeral directors must dress appropriately.

Overall, this profession enjoys earnings that are slightly above average. Funeral directors and embalmers earned an annual average of $30,700 in 1995. This compares with an all-occupation annual average wage of $27,900. However, for the 74% who worked full time for the whole year in 1995, the average earnings were $33,400, which is lower than the all-occupation level of $39,400. Men earned a significantly higher level than women in this occupation. For those who worked full time for the whole year, men earned an average of $35,300, compared to $24,800 for women.

Those wanting to enter this occupation need to be employed in order to apprentice in this field. Industry sources indicate that apprentices currently earn between $22,000 and $31,000. The current level of wages for more experienced workers varies. Industry sources suggest that those with up to 10 years' experience typically earn between $30,000 and $45,000. An assistant manager will earn between $39,000 and $55,000, and a manager will earn between $48,000 and $69,500.

Available statistics estimate that this very small profession employed 360 people in 1998, which was an increase of 90 workers (33%) over the 1990 employment level. However, industry sources suggest that the 1998 employment level was slightly higher at 385.

About 8.5% of all funeral directors and embalmers are self-employed, lower than the all-occupation average of 15%.

Part-time work is less common in this field, accounting for only 12.5% of all employment, compared to 26% for the workforce as a whole. Most people who work as funeral directors and embalmers work full time for the whole year.

Funeral directors and embalmers have an unemployment rate that is lower than the average for all occupations. Industry sources state that because apprentices are employed full time, when they complete their training they continue in their positions. This situation contributes to a low unemployment rate.

Funeral directors and embalmers is considered to be a professional occupation, but it is generally categorized under the personal and household services industry. Unlike many occupations where employment is spread across several industries, 100% of funeral directors and embalmers work in this single industry.

As befits its image as a retirement locale, the Okanagan/Kootenay region has a larger than average share of funeral directors and embalmers (31%). However, at 49% the Lower Mainland still employs the highest proportion of these workers. In addition, 17% of the workers are located on Vancouver Island, and 6% are in Northern B.C.

This occupation is dominated by men. Only 15% of the workers are women, which compares to 46% for the workforce as a whole.

The average age of this profession (43 years) is five years older than the norm for the B.C. labour force. There are somewhat fewer workers under 25 years of age (10%), and there are more workers over the age of 55 (20%). The respective all-occupation averages are 15% and 11%.

Employment Prospects

This is a very small occupational group, made up of only about 360 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment for this group to grow at an annual rate of 1.8%, about as fast as the average for all occupations. According to this projection, 100 positions will become available from 1998 to 2008. Over two-thirds of these openings will result from growth in the number of new jobs, and the remainder will result from the replacement of retired workers.

This occupation is one in which a long-standing tradition is feeling the effects of changing tastes and demographics. The population in B.C. will continue to age and grow, resulting in an increase in the number of annual deaths. The annual number of deaths will increase to about 37,740 in 2008 from 28,850 in 1998. The median age at death will rise from 78 to 79 years of age. This increased "market" for funerals will enhance business opportunities in the funeral home sector.

Consumer tastes, which determine the type of funeral or memorial services requested, are being affected by aging "baby boomers" and by immigration, especially in the Lower Mainland. For example, the increasing number of cremations reduces the demand for embalming services, caskets and full-size cemetery plots.

Increasing shortages of land in Vancouver and other urban areas are an important economic force shaping this occupation. Corporate reorganization will also have an impact on this occupation. Major companies are purchasing independent, family-owned funeral homes across North America.

According to industry sources, there is a current shortage of funeral directors and embalmers. Those who complete an apprenticeship rarely have difficulty finding full-time employment. These good employment prospects are expected to improve through to 2008.

Additional Information

Industry Training and Apprenticeship Commission
http://www.itac.gov.bc.ca

Funeral Service Association of B.C.
http://www.bcfunerals.com/careers.html

Related Occupations

- bereavement counsellors (in 4153 family, marriage and other related counsellors)
- funeral attendants (in 668 other elemental service occupations)
- funeral services general managers (in 00 senior management occupations)

> ***Funeral directors and embalmers is considered to be a professional occupation, but it is generally categorized under the personal and household services industry. Unlike many occupations where employment is spread across several industries, 100% of funeral directors and embalmers work in this single industry.***

Sales Representatives, Wholesale Trade (Non-Technical)

NOC 6411

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	16,260	22,850	30,740

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
7,890	3,710	11,600

Annual Growth 1998-2008 3.0%

Main Industries of Employment

Wholesale Trade	52%
Printing and Publishing	6%
Retail Trade	6%

Employment by Region

Lower Mainland	72%
Vancouver Island	11%
Northern B.C.	5%
Okanagan/Kootenay	12%

Self-employment 16%

Nature of the Work

Sales representatives in non-technical wholesale trade sell non-technical goods and services to retail, wholesale, commercial, industrial and professional clients. They are employed by establishments that produce or provide goods and services, such as petroleum companies, producers of food, beverage or tobacco products, clothing manufacturers, motor vehicle and parts manufacturers, hotels, business services firms and transportation companies. Sales representatives for wholesale trade who are supervisors are also included in this unit group.

Main Duties

Sales representatives, wholesale trade (non-technical) promote sales to existing clients, identify and solicit potential clients and provide clients with a presentation on the benefits and uses of goods or services. They estimate or quote prices, credit terms, warranties and delivery dates, and they prepare or oversee preparation of sales contracts. They also consult with clients after sale to resolve problems and provide ongoing support, and they review and adapt to information regarding product innovations, competitors and market conditions. They may supervise the activities of other sales representatives.

Example Titles

- graphic design sales representative
- freight sales agent
- hotel accommodations sales executive
- magazine sales representative - wholesale
- periodicals sales representative
- oil distributor
- food products sales representative
- security services sales consultant
- transfer company agent
- account executive - wholesale trade
- liquor sales representative - wholesale
- supervisor, wholesale trade representatives

©Stone/Vancouver

Education and Training

People in this field usually require a minimum of high school graduation, some product and factory experience, and on-the-job training for a period of six months to two years. Individuals may move into a sales position after gaining several years' experience in a variety of positions within the company. Most companies provide extensive sales-oriented training. Sales experience, a college or university diploma related to the commodity being sold, and courses in business, commerce, marketing and sales are all assets and are required for most positions.

For a review of business and commerce programs see the profile for Sales and Service Supervisors (621). For a review of sales and marketing programs see the profile for Technical Sales Specialists, Wholesale Trade (6221).

A pleasant personality, an ability to communicate, confidence and persuasiveness are needed for this type of work. People in sales must be self-motivated and able to work independently. They must have good analytical skills and be able to accept disappointment cheerfully. Physical stamina may also be necessary because representatives may have to walk, stand for long periods or carry product samples. Long and irregular hours as well as travel may be involved. Knowledge of computers is usually important, as is an ability to develop niche markets. A second language may be an asset.

Working Conditions

Sales representatives may need to spend considerable time travelling to carry out their sales goals, or they may conduct their activities from their offices by telephone, computer or facsimile machine. More often they will need to do a combination of both. Workers in this group will be in frequent contact with existing and potential clients.

They will often be required to walk long distances, carry product samples or stand for long periods. They will also need to spend time reading trade journals and business publications. They can expect to encounter intense competition with rivals and must deal with challenging quota goals established by their employers. Weekend and evening work is not uncommon.

In 1995 the average annual earnings for all workers in this occupation were $35,800. The 67% who worked full time for the full year earned an average of $43,000. The respective all-occupation averages were $27,900 and $39,400. According to a survey of recent college graduates, new entrants to these occupations earned an average of $2,270 per month ($27,200 per year).

The number of workers employed in this very large occupational group in 1998 was 22,850 which represents an increase of 6,590 workers (41%) over 1990. The proportion of workers that are self-employed (16%) is about the same as the all-occupation average. Most sales representatives work full time (88%), and 21% work full time for only part of the year. At 12% of the workers, the level of part-time employment is substantially lower than the average for the workforce as a whole (26%). The unemployment rate for this group is lower than the average for all occupations.

Non-technical wholesale trade sales representatives work in many different industries in B.C., with the largest concentrations found in wholesale trade (52%), retail trade (6%), printing and publishing (6%) and advertising (4%). This group is associated with the head offices of major goods and services wholesalers and needs easy access to major retailers and to primary transportation links to the rest of the province or to western Canada. It is not surprising that the large majority of wholesale trade sales representatives (72%) are located in the Lower Mainland. As for the balance of the workers in this occupational group, 12% are in the Okanagan/Kootenay region, 11% are on Vancouver Island, and 5% are in Northern B.C.

The number of women in this group (27%) is below the all-occupation average, but their representation among sales representatives has been increasing. There are fewer workers in the 15 to 24 age group (7%) compared to the workforce as a whole (15%). This probably reflects a need for experience with the product lines as well as a maturity to effectively handle the management level interactions associated with wholesale sales. The average age is 40, two years older than the average age for all occupations.

Employment Prospects

This is a very large occupational group, made up of about 22,850 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment for this group to grow at an annual rate of 3.0%, much faster than the average for all occupations. According to this projection, 11,600 positions will become available from 1998 to 2008. Most of these openings will result from growth in the number of new jobs (68%), and the remainder will result from the replacement of retired workers. Some additional openings will become available due to worker turnover.

Over half of these workers were employed in the wholesale trade industry in 1998. Overall employment in this industry is projected to grow more slowly than the economy-wide average due to the effect of technology on other workers in this industry whose jobs are being automated. However, there are areas of both high and low employment growth within this industry, and this particular occupation is an area of high employment growth. The volume of sales in this industry is growing due to rapid growth in tourism and a weak Canadian dollar, which will continue to encourage the export of B.C. goods. This growth in sales will be accompanied by a growing demand for *sales representatives* who directly interact with a growing and diversifying number of customers. These workers are not easily replaced with automation due to the personal interactive nature of their jobs.

Although unemployment is lower than the all-occupation average, there is keen competition for work in this group. Anyone entering this field must be able to familiarize themselves completely with their company's products and services as well as those of competitors. They must also be prepared to develop a thorough understanding of the needs and interests of potential clients, have the ability to anticipate trends or changes and be able to adapt quickly.

Those who have strong communication and marketing skills and can demonstrate that they are adept in the use of technological aids, such as computers, will have a better chance of getting work. Those who neglect to develop their skills in these areas may not be adequately prepared to provide the level of skills needed to compete for jobs.

Progression to sales management positions is possible with additional training or experience.

Related Occupations

- retail salespersons and sales clerks (6421)
- sales, marketing and advertising managers (in 01/09 middle and other management)
- technical sales specialists, wholesale trade (6221)

Retail Salespersons and Sales Clerks

NOC 6421

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	74,360	83,150	96,280

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
13,130	9,960	23,090

Annual Growth 1998-2008	1.5%

Main Industries of Employment

Retail Trade	79%
Wholesale Trade	9%
Other Service Industries	3%

Employment by Region

Lower Mainland	58%
Vancouver Island	19%
Northern B.C.	8%
Okanagan/Kootenay	16%

Self-employment	8%

Nature of the Work

Retail salespersons and *sales clerks* sell or rent a range of goods and services in stores and other retail businesses and in wholesale businesses that sell on a retail basis to the general public.

Main Duties

Retail salespersons and *sales clerks* greet customers and discuss the type, quality and quantity of merchandise sought for purchase or rental. They advise customers on use and care of merchandise, and they estimate or quote prices, credit terms, trade-in allowances, warranties and delivery dates. They also prepare sales contracts and merchandise for purchase or rental, they accept cash, cheque, credit card or automatic debit payment, and they assist in the display of merchandise.

Example Titles

- apprentice industrial engines and equipment partsperson
- retail salesperson
- automobile salesperson
- clothing salesperson
- retail sales clerk
- department store clerk
- counter clerk - retail
- car rental agent
- computer salesperson - retail
- audio equipment salesperson
- furniture salesperson
- hardware store clerk
- jewellery salesperson

Education and Training

Sales jobs do not normally require much formal education or much specific training. However, people who wish to succeed in this area must have basic mathematics skills and excellent interpersonal and communication skills. Employers often hire high school graduates who undergo training under the supervision of experienced salespeople. Good product knowledge and marketing skills are an asset, as many traditional sales functions are now done electronically, and sales personnel are expected to focus on customer service.

Demonstrated sales ability and product knowledge are usually required for those who sell complex or valuable merchandise, such as automobiles, antiques or computers. Knowledge of computerized systems is usually important in this field, and a second language can be an asset for some jobs. Marketing and sales courses are also assets. These workers must be neat in appearance, polite and friendly. They should be pleasantly persuasive.

For a review of marketing and sales programs, see the profile for Technical Sales Specialists, Wholesale Trade (6221).

Working Conditions

Salespersons must answer various inquiries about the products or services of the establishments for which they work. They are often either in direct contact with customers or in close proximity to them. Sales staff should be prepared to work some evenings and weekends.

In 1995 the average annual earnings for all workers in this occupational group were $15,900, well below the provincial average of $27,900. Roughly one-third of this group worked full time for the whole year, and they received an average of $27,800 in earnings, also well below the provincial average of $39,400. According to a survey of recent college graduates, those who found work in these occupations earned an average of $1,110 per month, or $13,300 per year. The average number of hours worked per week was only 28.

This is a very large occupational group, which experienced a relatively low level of growth (12%) between 1990 and 1998. However, the number of employed workers still increased substantially (by 8,790) from 74,360 in 1990 to 83,150 in 1998.

The proportion of this group who are self-employed (8%) is below the all-occupation average of 15%, while the proportion who work part time (45%) is much higher than the all-occupation average (26%).

Unemployment is about the same as the average for all occupations in B.C. The seasonal fluctuations and the temporary nature of work in this field are reflected in the fact that many people (52%) work either part time for part of the year or full time for only part of the year.

Most of the workers (79%) are employed in the retail trade, with the remainder working in the wholesale trade and service industries. The regional distribution of workers in this group is similar to general workforce patterns, with 58% located in the Lower Mainland, 19% on Vancouver Island, 16% in the Okanagan/Kootenay region and 8% in Northern B.C.

Women account for 62% of this group, which is substantially higher than the 46% all-occupation representation of women. There is also a very high proportion of young people. Workers aged 15 to 24 make up 31% of this group, which is more than double their representation in the all-occupation average of B.C. (15%). This is indicative of the entry-level work in these occupations, with the exception of sales of specialized or high-ticket items, such as automobiles or antiques, which usually require more experience or specialized knowledge.

Employment Prospects

This is one of the largest occupational groups in B.C., estimated at about 83,150 workers in 1998. The Canadian Occupational Projection System (COPS) projects employment for this group to grow at an annual rate of 1.5%, about as fast as the average for all occupations. According to this projection, 23,090 positions will become available from 1998 to 2008. Most of these openings (57%) will result from growth in the number of new jobs, and the remainder will result from the replacement of retired workers. Additional openings will become available due to worker turnover, as wages are often low and positions are sometimes seasonal.

Almost 80% of these workers were employed in the retail trade industry and almost 10% in the wholesale trade industry in 1998. Employment in these industries combined is expected to grow about as fast as the average for all occupations from 1998 to 2008. These industries tend to reflect the employment growth of the economy as a whole because of the wide range of products sold and close ties to most other industries in the economy. The retail trade industry includes all establishments that sell goods (such as gasoline, groceries, construction supplies and tooth picks) for use by consumers and households. The wholesale trade industry supplies these goods to retailers. A rapidly growing tourism sector is also a source of growth in these industries. According to Tourism B.C, nearly twenty-two million overnight visitors who visited B.C. in 1998 spent $8.8 billion, an increase of 3.5% from 1997. The weak Canadian dollar is expected to continue to encourage the export of B.C. goods. However, the increasing availability and use of the Internet will continue to increase online purchases, which may limit the growth of traditional retail establishments. To some extent this may also limit employment growth in the retail industry.

Those employed in the clothing, footwear, home furnishing and music sectors should be experienced and must be aware of the latest fashions and trends, especially when dealing with young shoppers. Retail salespersons are usually required to demonstrate sales ability and product knowledge when selling complex or valuable merchandise, such as automobiles, antiques and computers. They must be able to work with computers and be prepared to perform such tasks as inventory restocking and reporting sales trends among products. However, many retail establishments now use computerized inventory systems to track the flow of goods automatically and place orders electronically directly to suppliers. This reduces the need for workers to perform these duties.

Highly specialized stores require employees with thorough knowledge of their particular products or services. Those who already have experience selling those specific products or services will have an advantage in obtaining work in these stores.

These factors, and the move by retailers to streamline operations, reduce costs and adapt quickly to changing market trends and conditions, are reducing the number of full-time jobs and increasing part-time work in this field. Progression to retail supervisory positions is possible with additional training or experience.

Related Occupations

- cashiers (661)
- retail stock clerks (in 662 other sales and related occupations)
- sales clerk supervisors (in 621 sales and service supervisors)

Travel Counsellors

NOC 6431

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	3,280	5,010	5,990

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
980	650	1,630

Annual Growth 1998-2008 1.8%

Main Industries of Employment

Other Service Industries	90%
Finance, Insurance, and Real Estate	4%
Public Transit and Other Transportation	1%

Employment by Region

Lower Mainland	72%
Vancouver Island	13%
Northern B.C.	5%
Okanagan/Kootenay	9%

Self-employment 12%

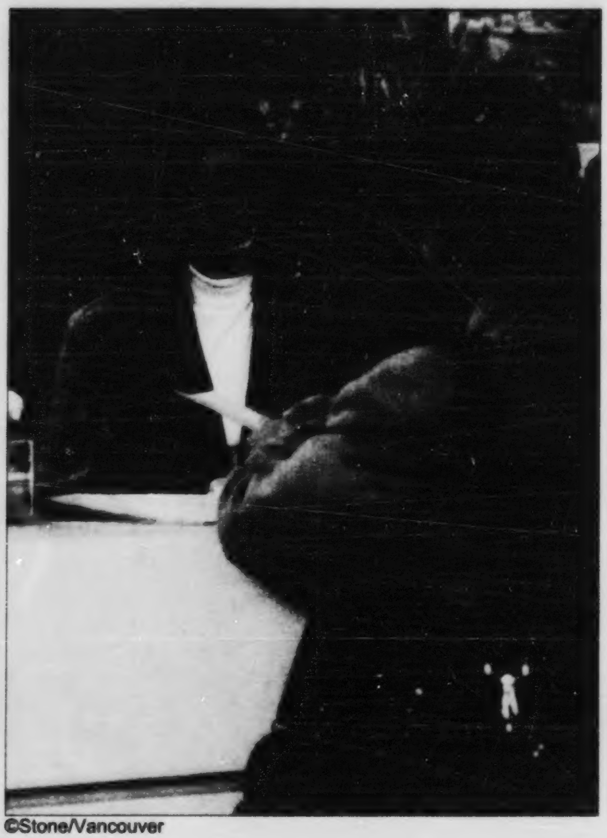
Nature of the Work

Travel counsellors advise clients on travel options and tour packages, make bookings and reservations, prepare tickets and receive payment. They are employed by travel agencies, hotel chains and transportation and tourism firms.

Main Duties

Travel counsellors provide travel information to clients regarding destinations, transportation and accommodation options, and travel costs. They plan and organize vacation travel for individuals or groups, make transportation and accommodation reservations using computerized reservation and ticketing systems, and sell single fare tickets and package tours to clients. They also promote particular destinations, tour packages and other travel services. They provide travel tips regarding tourist attractions, foreign currency, customs, languages and travel safety, and they provide information and arrange tickets for theatres or special events.

Further, they sell cruise holidays, arrange car or motor-home rentals and rail travel, and sell insurance for medical, baggage or life. They may also counsel clients on terms and conditions of travel (for example, reservation policy and cancellations), on potential situations (for example, political unrest) and on required vaccinations, and they may advise clients on where to obtain the most up-to-date information on their intended destinations.



©Stone/Vancouver

6

Example Titles

- travel agent
- travel consultant

Education and Training

Grade 12 is the minimum education required to enter into the field of travel counselling, but applicants have a better chance of employment if they have taken a travel and tourism program from a school or college accredited by the Canadian Institute of Travel Counsellors (CITC). A certified travel counsellor designation is granted by CITC and the Alliance of Canadian Travel Associations after three years of work experience and completion of courses and examinations. Computer experience and sales skills are generally required. Human resource skills and accounting knowledge may be beneficial for those who wish to succeed.

Camosun College and North Island College both offer six-month travel counselling certificate programs, which prepare students for entry-level positions as *travel counsellors*. This program can be taken part time at Camosun. Vancouver Community College offers a seven-month Travel Agent certificate, which provides students with skills and knowledge to enter the travel agency profession. The continuing education departments at Kwantlen University College (KUC) and Okanagan University College offer Travel Counsellor certificate programs. KUC follows this up with about four weeks of work experience for qualifying students. Grade 12 is required for admission into all of these programs, and keyboarding skills and knowledge of geography are either required or recommended.

Travel counsellors need good written and oral communication skills, and knowledge of another language, especially French, Japanese or German, is an asset. Strong interpersonal skills and an aptitude for selling are important. Organizational and problem-solving abilities are needed, and computer skills are usually required. These people should enjoy performing detailed work, be able to work under pressure and have good memories. They should enjoy helping others. Travel experience is an asset, as is knowledge of geography.

Working Conditions

Travel counsellors spend a large amount of their time behind a desk conferring with clients, developing itineraries, promoting group tours and contacting hotels, airlines and car rental outlets. They work some evenings and weekends during peak travel periods, and they can expect to work under tremendous pressure. Those who are self-employed usually work longer hours.

In 1995 the average annual earnings for all travel counsellors in B.C. were $20,600. The 52% who worked full time for the full year earned an average of $25,300. The respective all-occupation averages were $27,900 and $39,400. According to a recent survey of college graduates, those who found work in this occupation reported an average earnings of $1,570 per month ($18,800 per year).

In 1990 there were 3,280 people employed as travel counsellors in B.C. This number increased by 1,730 (53%) to 5,010 workers in 1998.

About 12% of this group is self-employed, which is slightly below the all-occupation average of 15%. The proportion of people working part time in this field (19%) is also below the workforce average (26%). The level of seasonal work in this field is about the same as for the all-occupation average. About 41% of the workers are employed either as full time but for only part of the year or as part time for part of the year. The rate of unemployment is less than the average for all occupations.

Nearly 90% of this occupational group work in other service industries, the major employer being travel agencies. The balance are employed by government, air transport companies and the accommodation industry. This is primarily an urban occupation, with 72% of the workers located in the Lower Mainland. Vancouver Island accounts for 13%, the Okanagan/Kootenay region 9% and Northern B.C. 6%.

This occupation is dominated by women. Women account for 82% of all travel counsellors in B.C. This group tends to be slightly younger than average, with 46% of the workers under the age of 35, compared to 40% for all occupations in B.C. The average age is 38.

Employment Prospects

This is a large occupational group, made up of about 5,010 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment for this group to grow at an annual rate of 1.8%, about as fast as the average for all occupations. According to this projection, 1,630 positions will become available from 1998 to 2008. Most of these openings (60%) will come from growth in the number of new jobs. The remainder will come from the need to replace workers who retire. Travel counsellors often move between jobs once they have experience in order to obtain higher pay. Consequently some additional openings will become available due to worker turnover.

A major source of uncertainty with this forecast is the automation of certain services that have been provided traditionally by *travel counsellors*. For example, the Air Canada Online Websaver program now enables customers to view and book their tickets online as well as sending subscribers weekly e-mails about last-minute travel sell-offs. Other airlines also are using electronic ticketing, which will reduce staffing requirements. This could force small travel agencies out of business.

An additional source of uncertainty with this forecast is the restructuring currently underway in the airline industry. In January 2000 Air Canada took over Canadian Airlines. There is disagreement among industry sources as to what the effects of this will be. This merger may affect the rate of ticket sales in the short and long term, and this would directly affect the employment of *travel counsellors*. Some analysts suggest that the reduction in competition will push air ticket prices up and reduce the overall amount of Canadian air traffic. Others say that the merger will reduce the destructive components of domestic competition among airlines and, in this way, increase the overall efficiency of the airline industry. Some of these savings may be passed on to consumers in the form of lower ticket prices, which may ultimately increase the number of tickets being sold.

Growth in business travel may be restricted because communication technologies, such as videoconferencing, enable companies to conduct business with clients and business associates without travelling. With much economic growth concentrated in small business and self-employment, the ability to fund business trips is lower.

A rapidly growing tourism industry is a source of growth for these workers. *Travel counsellors* are organizing tours for a growing number of foreign visitors. According to Tourism B.C, $8.8 billion was spent by the nearly twenty-two million overnight visitors who visited B.C. in 1998. This is an increase of 3.5% from 1997. The weak Canadian dollar is expected to attract a growing number of U.S. and European tourists to B.C. Canadian travelers will also have an added incentive to travel domestically, and B.C. is a popular tourist destination in Canada. An additional indicator that tourism in B.C. is on the rise is that in 1999 about 8.5% more tourists came to B.C. on cruise ships than in 1998. More than a third of these tourists spent at least one night in Vancouver. This increase in tourism is largely responsible for the astonishing 28% increase in hotel rooms in the greater Vancouver area from 1996 to 2000. Despite this increase in the number of hotel rooms, industry sources indicate that shortages of rooms still exist during peak summer seasons.

Competition for job openings in this field is keen. Those who are fluent in a number of different languages, particularly Asian languages, have the best opportunity to penetrate and succeed in this field. Computer skills are also considered to be an asset by employers.

Employment in this field is very sensitive to economic conditions, so the number of openings is likely to fluctuate throughout this overall growth period. Progression to managerial positions is possible with experience.

Additional Information

Canadian Tourism Human Resource Council
http://www.cthrc.ca

Pacific Rim Institute of Tourism http://www.prit.bc.ca

Related Occupations

- airline ticket agents (in 6433 airline sales and service agents)
- convention coordinators (in 1226 conference and event planners)
- travel agency managers (in 01/09 middle and other management)

6

> ***Competition for job openings in this field is keen. Those who are fluent in a number of different languages, particularly Asian languages, have the best opportunity to penetrate and succeed in this field. Computer skills are also considered to be an asset by employers.***

Pursers and Flight Attendants

NOC 6432

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	2,110	2,370	2,580

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
210	290	500

Annual Growth 1998-2008	0.9%
Main Industries of Employment	
Air Transportation	98%
Accommodation and Food Services	1%
Water Transportation	1%
Employment by Region	
Lower Mainland	91%
Vancouver Island	6%
Northern B.C.	0%
Okanagan/Kootenay	3%
Self-employment	1%

Nature of the Work

Airline pursers and *flight attendants* ensure the safety and comfort of passengers during flights. *Ship pursers* attend to the safety and comfort of passengers aboard ships. Airline pursers and flight attendants are employed by airline companies. Ship pursers are employed by tour or cruise boat companies.

Main Duties

Flight attendants greet passengers, explain safety procedures, attend to the safety of passengers during take-offs, landings and emergencies, serve food and beverages to passengers, and make flight announcements.

Flight pursers and *passenger service directors* coordinate the activities of flight attendants, provide service to passengers during flights and complete reports.

Ship pursers supervise ship attendants, arrange activities for passengers and conduct ship's business, such as signing on crew, maintaining payroll records, assisting passengers in preparing customs declarations and supervising baggage storage.

Example Titles

- flight service director
- passenger service director
- ship purser
- purser, airline

Education and Training

Flight attendants and *pursers* require completion of grade 12 or equivalent and a training program of up to seven weeks provided by the employer and approved by Transport Canada. This is followed by probationary in-service training. Pursers also require experience as flight attendants. Ship pursers may require experience as ship attendants. Canadian citizenship and good medical health are necessary. Experience working with the public and fluency in more than one language are both assets.

These workers need to be neat in appearance, tactful, discreet and resourceful. They must be reliable, organized, flexible and able to take charge when necessary. They should enjoy working with a variety of people and as a member of a team. They generally must be willing to relocate if necessary. In order to advance, post secondary education in a relevant field and upgrading in areas such as computer skills are generally necessary.

Working Conditions

Flight attendants and *airline pursers* may work at night, on weekends and during holidays. They can spend 75 to 85 hours a month on flights and a similar number of hours carrying out duties in preparation for flights, waiting for planes that arrive late, writing reports after completed flights and carrying out other post-flight duties.

Due to variations in scheduling and limitations on permitted flying time, some workers may have 11 or more days off each month. However, they may be away from their home base as much as one-third of the time. Their employers provide hotel accommodations and an allowance for meal expenses during such periods of down time while away from home.

Because of the duration of ship voyages, *ship pursers* generally spend even longer periods aboard vessels than their airline counterparts spend in the air. As a result, many of their off-duty hours are spent aboard ship during the voyage. They too must spend some time preparing for trips, conducting passenger service duties, filling out reports and other paperwork, and carrying out post-voyage responsibilities.

The work can be strenuous and tiring at times as employees often work through several time zones and may experience jet lag. On flights that encounter strong air turbulence, serving meals and drinks can be difficult. Short flights on which meals are served require fast service and good timing. Attendants are on their feet for much of the flight and must remain composed, prompt and polite regardless of how tired they are or how demanding the passengers may be. They also can be susceptible to injury due to the requirements of working in a moving airplane.

Although difficult weather conditions do not affect their work to the same extent, ship pursers must also be prepared to carry out their duties on rough seas or during other disruptive environmental situations.

While pursers and flight attendants must deal with these challenges, they also enjoy extended periods of free time, access to discount fares and the opportunity to travel and see new places.

The average annual earnings for all B.C. workers in these occupations were $32,000 in 1995. The 57% who worked full time for the whole year earned $36,500 on average. The respective all-occupation average earnings were $27,900 and $39,400. A recent survey of college graduates who found work in this field earned an average of $2,750 per month ($33,000 per year).

This is a medium-sized occupational group that has seen only a modest level of growth (12%) between 1990 and 1998. There were 2,110 workers in 1990, and this increased to 2,370 by 1998. There is no self-employment in this occupation. Approximately 86% work full time, and 14% work on a part-time basis. By comparison, the all-occupation rates are 74% and 26%. The unemployment rate is lower than the average for all occupations.

Most (98%) workers in this group are employed in air transportation, with the remainder working in water transportation or accommodation and food services.

Given the fact that workers in these occupations should have easy access to a major airport or a cruise ship terminal/port, it is not surprising that almost all of the pursers and flight attendants in B.C. (91%) are based in the Lower Mainland. About 6% are located on Vancouver Island, and 3% are located in the Okanagan/Kootenay region.

Positions in this group traditionally have been staffed by women. Women still make up the large majority (80%) of this group. It is no longer an occupation only for the very young. In fact, there are fewer than average workers in the 15 to 24 age group (8%), and workers aged 35 to 44 (35%) outnumber those aged 25 to 34 (28%). The average age is 38.

Employment Prospects

This is a medium-sized occupational group, made up of about 2,370 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment for this group to grow at an annual rate of 0.9%, slower than the average for all occupations. According to this projection, 500 positions will become available from 1998 to 2008. Most of these openings (58%) will come from the need to replace workers who retire. The remainder will come from growth in the number of new jobs. Some additional openings will become available due to worker turnover.

A major source of uncertainty with this forecast is the restructuring currently underway in the airline industry. In January 2000 Air Canada took over Canadian Airlines. There is disagreement among industry sources as to what the effects of this will be. This merger may affect the rate of ticket sales in the short and long term, and this would directly affect the employment of *flight pursers* and *flight attendants*. Some analysts suggest that the reduction in competition will push air ticket prices up and reduce the overall amount of Canadian air traffic. Others say that the merger will reduce the destructive components of domestic competition among airlines and, in this way, increase the overall efficiency of the airline industry. Some of these savings may be passed on to consumers in the form of lower ticket prices, which may ultimately increase the number of tickets being sold. Although Air Canada has announced that there will be no involuntary layoffs, some analysts predict that a short-term effect of the merger will be a 10% decline in the number of workers currently working for the two airlines.

A rapidly growing tourism industry is a source of growth for these workers. Pursers and flight attendants are providing services for a growing number of foreign visitors. About 8.5% more tourists came to B.C. on cruise ships in 1999 than in 1998, increasing the demand for *ship pursers*.

Competition for openings in this field is keen. Those who are fluent in a number of different languages, particularly Asian languages, have the best opportunity to penetrate and succeed in this field. Those who have some post secondary education and substantial experience working with the public also will be in a good position to be selected for the relatively few employment opportunities. It should be noted that there is little mobility between airline pursers and ship pursers.

Related Occupations

- food and beverage servers on trains (in 645 occupations in food and beverage service)
- ship and rail service attendants (in 667 other attendants in travel, accommodation and recreation)

Airline Sales and Service Agents

NOC 6433

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	2,110	2,410	2,610

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
200	300	500

Annual Growth 1998-2008 0.8%

Main Industries of Employment

Air Transportation	92%
Other Service Industries	4%
Other Business Services	2%

Employment by Region

Lower Mainland	85%
Vancouver Island	5%
Northern B.C.	6%
Okanagan/Kootenay	4%

Self-employment 0%

Nature of the Work

Airline sales and *service agents* issue tickets, make reservations, trace missing baggage, arrange cargo shipments and perform other customer service duties to assist airline passengers. Airline sales and service agents are employed by airline companies. Load planners, who plan the positioning of cargo on aircraft, are also included in this occupational group.

©Stone/Vancouver

Main Duties

Airline passenger and *ticket agents* prepare and issue tickets, assign seats, prepare boarding passes, check baggage, attend boarding gates, assist pre-boarding passengers and provide information on fares, flight schedules and routes.

Airline baggage agents trace lost, delayed or misdirected baggage for customers.

Airline cargo agents weigh cargo, compute freight costs and calculate charges for services and insurance. They also process bills for landing, cargo manifests and other documents. They trace lost or misdirected cargo, and they maintain shipping and other records.

Airline reservation agents reserve seats for tour companies, travel agencies, wholesalers and the general public using computerized reservation systems.

Airline station agents complete pre-flight documents for passenger and cargo load, catering count, special requests and other flight information, and relay operational messages to operations control and downline stations. They also perform the duties of ticket, baggage and cargo agents.

Airline load planners calculate load weights for compartments of aircraft using charts and computers, and plan loads to properly distribute and balance cargo.

Example Titles

- ticket agent, airline
- station agent, airline
- load planner, airline
- airline baggage agent
- counter services agent, airline
- airline cargo agent
- customer service agent, airline
- passenger agent, airline
- baggage tracer, airline
- reservation agent, airline

Education and Training

Grade 12 is the usual minimum educational requirement for these occupations, but applicants have a better chance of employment if they have taken a travel and tourism program from a school or college accredited by the Canadian Institute of Travel Counsellors (CITC). Employers usually provide on-the-job training or pre-employment training to new recruits, especially ticket/reservation agents, for a period varying from two to six months. Airline station agents usually require experience as a ticket, baggage or cargo agent. Load planners require a restricted radio operator's licence and usually some airline operations experience. Work experience in sales or in a related public contact position is often valuable.

Camosun College, Kwantlen University College, Okanagan University College and Vancouver Community College all offer travel programs of four to six months' full-time study, which satisfy CITC educational requirements. Part-time study is available at some institutions. Grade 12 is required for admission, and keyboarding skills and knowledge of geography are either required or recommended.

Desirable personal qualities for these workers include strong communication and interpersonal skills, basic analytical and computer skills and an aptitude for selling. Knowledge of another language, especially French, Japanese or German, is an asset.

Working Conditions

Agents should be prepared to work in fast-paced settings with a fair amount of activity and noise. They can expect to have continuous contact with airline passengers and other clients for long periods during their work shifts. In certain positions included in this occupational group, such as baggage or cargo agent, workers have to lift and arrange heavy luggage and parcels.

In 1995 the average annual earnings for all B.C. workers in this group were $28,800. Over half of this group (53%) were employed full time for the whole year, and these workers earned an average of $35,800 per year. The respective all-occupation averages were $27,900 and $39,400. According to a survey of recent college graduates who found work in this occupational group, the average monthly level of earnings were $1,580 ($18,900 per year).

This is a medium-sized occupational group. There were 2,410 people employed as *airline sales* and *service agents* in 1998, up 300 (14%) over 1990.

About 77% work full time, and 23% work part time. The comparable all-occupation averages are 74% and 26%. The level of seasonal work is somewhat lower than for the workforce as a whole. About 36% of these workers are employed either part time, part year or full time for only part of the year. The comparable workforce figure is 45%. Self-employment is not a factor in this field. The rate of unemployment is lower than the average for all occupations.

Most workers in this group are employed in air transportation (92%), with the remainder employed in the other service and business industries. Employment is concentrated in the Lower Mainland, with 85% of the workers in B.C. located in that region. As for the balance of the workers, 6% are in Northern B.C., 5% are on Vancouver Island, and 4% are in the Okanagan/Kootenay region.

Women account for 66% of this group, substantially higher than the all-occupation average of 46%. The age distribution of airline sales and service agents in B.C. is similar to that for the all-occupation average. At 39, the average age for this group is one year older than the average for the workforce as a whole.

Employment Prospects

This is a medium-sized occupational group, made up of about 2,410 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment for this group to grow at an annual rate of 0.8%, slower than the average for all occupations. According to this projection, 500 positions will become available from 1998 to 2008. Most of these openings (60%) will come from the need to replace workers who retire. The remainder will come from growth in the number of new jobs.

A major source of uncertainty with this forecast is the restructuring currently underway in the airline industry. In January 2000 Air Canada took over Canadian Airlines. There is disagreement among industry sources as to what the effects of this will be. This merger may affect the rate of ticket sales in the short and long term, and this would directly affect the employment of *airline sales* and *service agents*. Some analysts suggest that the reduction in competition will push air ticket prices up and reduce the overall amount of Canadian air traffic. Others say that the merger will reduce the destructive components of domestic competition among airlines and, in this way, increase the overall efficiency of the airline industry. Some of these savings may be passed on to consumers in the form of lower ticket prices, which may ultimately increase the number of tickets being sold. Although Air Canada has announced that there will be no involuntary layoffs, some analysts predict that a short-term effect of the merger will be a 10% decline in the number of workers currently working for the two airlines.

Advances in and growing use of technology will continue to have a large negative effect on the employment of *airline sales* and *service agents*. For example, the Air Canada Online Websaver program now enables customers to view and book their tickets online as well as sending subscribers weekly e-mails about last-minute travel sell-offs.

Competition for work in this field is very keen, with the number of qualified applicants far exceeding the number of openings. With growth in passenger traffic anticipated for the Asia-Pacific region, those with Asian language skills will have a greater chance of getting work. Those who have some post secondary education and substantial experience working with the public also will be in a relatively good position to be selected for the relatively few employment opportunities.

Additional Information

Canadian Tourism Human Resource Council http://www.cthrc.ca

Pacific Rim Institute of Tourism http://www.prit.bc.ca

Related Occupations

- travel counsellors (6431)
- airline cargo and baggage handlers (in 743 other transport equipment operators and related workers)
- supervisors of airline sales and service agents (in 621 sales and service supervisors)

Front Desk Agents

NOC 6435

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	3,350	3,850	4,360

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
510	490	1,000

Annual Growth 1998-2008 1.3%

Main Industry of Employment

Accommodation and Food Services	100%

Employment by Region

Lower Mainland	46%
Vancouver Island	22%
Northern B.C.	10%
Okanagan/Kootenay	21%

Self-employment 3%

Nature of the Work

Front desk agents assist with all aspects of guest services and present a positive impression of the establishment. They make room reservations, provide information and services to guests and receive payment for services. They are employed by hotels, motels and resorts.

Main Duties

Workers in this occupational group make room reservations, register arriving guests, assign rooms and answer enquiries regarding hotel services and registration by letter, telephone and in person. They also respond to guests' enquiries, requests and complaints. They compile and check daily record sheets, guest accounts, receipts and vouchers using computerized or manual systems, and they present statements of charges to departing guests and receive payment.

Example Titles

- front office agent
- front desk agent
- guest service agent
- night clerk
- room clerk

- reservations agent

Education and Training

Grade 12 is the minimum educational requirement for employment as a *front desk agent*. Generally, companies provide on-the-job training, which lasts from two to four weeks. Applicants who have completed a hotel management, hospitality administration or tourism supervision program are at a definite advantage. Those without college training usually start as information or mail clerks, bellhops or cashiers. Work experience in sales or in the hospitality industry is helpful.

Many colleges offer courses within tourism, hotel management and hospitality programs that are relevant to employment as a hotel front desk agent. For a review of these programs see the profile for Sales and Service Supervisors (621).

Certification is available, but not mandatory, for front desk (and reservations sales) agents. Granted by the Association of Tourism Professionals arm of the Pacific Rim Institute of Tourism, following a written examination, a skill review and an evaluation by a trained volunteer, certification acknowledges that a person has the level of knowledge, skills and attitude acceptable by industry standards. The Institute can be contacted at 800 - 1185 West Georgia Street, Vancouver, B.C., V6E 4E6 or call (604) 682-8000 or fax (604) 688-2554.

These employees should have a neat appearance and good communication skills. They need basic analytical skills and experience with word processing equipment and computers. A second language is often an asset. Stamina is needed since desk agents are usually on their feet. A willingness to work shifts and flexibility are important, since small operations may require desk agents to perform additional duties. Good judgement is necessary, since they may at times have to deal with difficult people as well as emergency and security problems.

Working Conditions

Front desk agents generally perform their duties in the establishment's lobby at a reception area that is usually very visible, clean and well-lit. The work schedule for a front desk agent can be irregular, with some shifts during evenings, late nights, weekends and holidays.

These agents may spend much of their shifts on their feet and usually in the public eye. During holidays and other peak periods the pace of work can be hectic because of the large volumes of people to be served. Front desk agents also take on a sometimes emotionally draining role as a buffer between customers and the management of the establishment. In the case of mishandled reservations or other errors, they must be prepared to deal with angry or difficult individuals. However, they do meet a wide variety of individuals, and the broad range of their duties can provide them with much insight and experience in customer service and guest relations.

In 1995 the average annual earnings for all workers in this occupation in B.C. were $16,400, while the 41% who worked full time for the whole year earned an average of $22,200. Both of these figures are well below the all-occupation averages of $27,900 and $39,400 respectively. In the first case, the lower earnings level reflects a relatively high proportion of seasonal work included in the average. In the case of full-time, full-year positions, the average earnings are lower because this occupation tends to be an entry-level position. According to a study of recent college graduates who found work in this occupation, the average earnings were $1,580 per month ($19,000 per year).

This is a medium-sized occupational group, with the number of workers employed in 1998 standing at 3,850, up 500 (15%) over 1990. The tourism industry has seasonal peaks, and this is reflected in a relatively high level of workers in this occupation (36%) who work full time for only part of the year. This compares to only 27% for the workforce as a whole. In some communities the difference between peak and off-peak season volume has been reduced (for example, non-winter months in Whistler) by developing off-peak activities and increasing marketing efforts for the off-peak season.

The mix of full-time (77%) and part-time (23%) workers is similar to the all-occupation averages. Self-employment is very low (3%) for this occupation, and the unemployment rate is lower than the average for all occupations.

All of the front desk agents in B.C. are employed in the accommodation and food services industry. Approximately 46% of hotel front desk agents work in the Lower Mainland. This region's representation is lower than the all-occupation average of 57%, which reflects the importance of tourism in areas away from the Lower Mainland and the development of accommodation facilities throughout the province. The Okanagan/Kootenay region accounts for 21% of the workers, 12 % are located in Victoria, 10% are located on the rest of Vancouver Island, and 10% are located in Northern B.C.

Women account for 68% of the workers in this group, substantially higher than the 46% that they represent in the workforce as a whole. The entry-level nature of this work is reflected in a high proportion of young workers. The 15 to 34 age group accounts for 66% of all the workers in this occupation, compared to only 40% for the workforce as a whole. The average age is 33, five years younger than the average for all occupations.

Employment Prospects

This is a medium-sized occupational group, made up of about 3,850 workers in B.C. in 1998. The Canadian Occupation Projection System (COPS) projects an annual employment growth rate of 1.3%, slower than the average for all occupations. According to this projection, 1,000 positions will become available from 1998 to 2008. These openings will be evenly divided between new jobs and openings to replace retiring workers. Due to relatively low wages and irregular work schedules, many additional openings will become available from worker turnover.

The growing use of labour-saving technologies by hotel management is behind the low growth in employment in this occupation. This low growth occurs despite expectations that the accommodation industry will experience high employment growth. Computerized systems increasingly provide many of the services that *front desk agents* traditionally provided. For example, check-in and check-out procedures are now automated in many larger establishments, allowing guests to bypass the front desk. Interactive television and computer systems to dispense information also will act to slow the employment growth of hotel front desk agents. In addition, some of the growth in business travel will be offset by the growing use and development of communication technologies, such as videoconferencing.

Growth in employment in the accommodation and food services industry, which is driven by a rapidly growing tourism sector, will be a source of some employment growth for this occupation. This industry, which employs all of these workers, is expected to grow much faster than the all-industry average from 1998 to 2008. According to Tourism B.C, nearly twenty-two million overnight visitors visited B.C. in 1998, an increase of 3.5% from 1997. This increase in tourism is largely responsible for the astonishing 28% increase in hotel rooms in the greater Vancouver area from 1996 to 2000. Despite this increase in the number of hotel rooms, industry sources indicate that shortages of rooms exist during peak summer seasons.

Competition for openings in this field is keen. Those who are fluent in more than one language have the best opportunity to enter this field. Progression to senior positions, such as accommodations manager, is possible with additional training and experience.

Additional Information

Canadian Tourism Human Resource Council
http://www.cthrc.ca

Pacific Rim Institute of Tourism http://www.prit.bc.ca

Related Occupations

- travel counsellors (6431)
- other attendants in accommodation and travel (except airline travel) (in 667 other attendants in travel, accommodation and recreation)

Those who are fluent in more than one language have the best opportunity to enter this field.

Tour and Recreational Guides

NOC 644

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	2,770	5,600	6,880

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
1,280	2,070	3,350

Annual Growth 1998-2008	2.1%
Main Industries of Employment	
Other Business Services	52%
Other Service Industries	15%
Public Transit and Other Transportation	9%
Employment by Region	
Lower Mainland	47%
Vancouver Island	23%
Northern B.C.	13%
Okanagan/Kootenay	16%
Self-employment	22%

Nature of the Work

Tour and *travel guides* escort individuals and groups on trips, on sightseeing tours of cities and on tours of historical sites and establishments, such as famous buildings, manufacturing plants, cathedrals and theme parks. They also provide descriptions and background information on interesting features. Tour and travel guides are employed by tour operators, resorts, attractions and other establishments, or they may be self-employed.

Outdoor sport and *recreational guides* organize and conduct trips or expeditions for sports enthusiasts, adventurers, tourists and resort guests. They are employed by private companies and resorts, or they may be self-employed.

Main Duties

Tour guides transport or escort individuals or groups on tours of cities, waterways and establishments, describe points of interest, answer questions and supply information. They may also collect admission tickets and sell souvenirs.

Travel guides escort individuals and groups on vacation and business trips, ensure that reservations for transportation and accommodations are confirmed and prepared itineraries are met, visit and describe points of interest, plan and carry out recreational activities and resolve problems with itineraries, service and accommodations.

Outdoor sport and *recreational guides* plan itineraries for trips or expeditions and either arrange transportation or transport individuals or groups to designated locations. They assemble necessary equipment and supplies, such as camping gear, rafts, life jackets, fishing tackle and food, and they lead or escort individuals or groups. They advise on safety and emergency measures, techniques and the use of equipment as well as on specific regulations, such as hunting and fishing laws and boating regulations. They may also provide first aid in emergency situations.

Example Titles

tour and travel guides (6441):
- tour director
- local tour guide
- heritage interpreter
- factory tour guide
- sightseeing guide
- caleche driver

outdoor sport and recreation guides (6442):
- nature guide
- wildlife viewing guide
- kayaking guide
- canoeing guide
- rafting guide
- hot air balloonist
- dude wrangler
- outfitter
- fishing guide
- hunting guide
- mountain climbing guide

LOBBY
NCE CE

©Stone/Vancouver

Education and Training

Generally, on-the-job training is provided for persons in these occupations. Some positions may require completion of secondary school. Self-directed learning of appropriate skills or completion of an outdoor recreation program is generally necessary to work as an outdoor guide. Knowledge of laws concerning wildlife is necessary for wildlife and hunting guides. Fluency in more than one language is often an asset. Special vehicular licences and first aid certificates may be required.

Certification is available but not mandatory for *tour guides*. Certification is granted by the Association of Tourism Professionals arm of the Pacific Rim Institute of Tourism, following a written examination, a skill review and an evaluation by a trained volunteer. Certification acknowledges that a person has the level of knowledge, skills and attitude acceptable by industry standards. The Institute can be contacted at 800 - 1185 West Georgia Street, Vancouver, B.C., V6E 4E6 or call (604) 682-8000 or fax (604) 688-2554.

University College of the Cariboo (UCC) offers a one-year Tour Coordinator certificate program for persons seeking employment as tour guides. Applicants must have grade 12. The program includes both tour guiding principles and tour operation principles. UCC also offers the Adventure Travel Guide diploma, a two-year program designed to train graduates to work within the adventure tourism industry as guides and/or small business owners. Grade 12 or equivalent, an interview and proven good medical health is required for admission. Keyboarding and computing skills are recommended. This program includes opportunities to prepare for national-level certification in a number of outdoor recreation areas. In addition to the certificate and diploma, UCC also offers a bachelor's degree in tourism management, with a major concentration in adventure tourism. This degree is intended to provide advanced tourism management and entrepreneurial skills for individuals to work as business owners, programmers and managers in the tourism industry.

Northwest Community College offers a 90-day Wilderness Guiding Skills program. Applicants should be 19 years of age or older, proficient in the use of English and mathematics (recommended minimum of grade 10 or equivalent), a competent swimmer and physically fit (medical assessment to be completed prior to acceptance). College of the Rockies (COTR) offers an Adventure Tourism Management Skills/Business Development program. Applicants must be at least 17 years old and can choose to study either summer or winter activities in this ten-month certificate program. COTR also has a Leisure and Recreation Services Management program that includes outdoor recreation studies. This program is designed to allow students to study full or part time and either to receive a diploma after two years of study or to receive a certificate and transfer into a university degree program after one year of study. Applicants should be medically fit, with grade 12 or equivalent.

Camosun College offers a ten-month Recreation Leadership program that includes outdoor activities. Applicants must have grade 12, proven good health, good swimming skills and CPR Level C. This program prepares students for employment or for continued education in leisure studies or related fields, such as adventure tourism. Langara College has a two-year diploma and an eight-month post-diploma certificate in recreation leadership. These programs provide students with skills and knowledge to work in a variety of positions in recreation agencies. Applicants must pass a medical exam and interview to qualify.

Malaspina University College offers a two-year diploma in recreation administration. Admission requirements include grade 12 or equivalent and a letter of reference from someone working in a relevant field. Students can apply to third year of a degree program in either recreation or tourism management upon completion of the diploma. Capilano College has a two-year diploma in outdoor recreation management. Applicants must be at least 19 years of age, medically and physically fit and with a good academic background and previous relevant outdoor experience. Capilano also offers a part-time certificate program in wilderness leadership for which applicants must be at least 19 years old with grade 12 or equivalent.

People who work in this area need to be friendly and outgoing, patient and good communicators. They must have leadership qualities and enjoy working with diverse groups of people. An eye for detail, a good memory and an ability to solve problems and respond to changing conditions or unexpected occurrences is necessary. An awareness of safety issues is vital. Skill at budgeting time and money is often needed. Outdoor guides need good physical health, and they must be willing to be away from home and work long hours during busy seasons. A knowledge of history, geography and art can be helpful for those in this field.

Working Conditions

Tour and *recreational guides* spend much of their time in direct contact with clients, so they are usually expected to be outgoing, communicative, approachable and responsive. The understanding while on tour is that clients are in their care, so these guides should have good attention to detail. Many of them should also expect to find themselves in outdoor situations much of the time.

In 1995 the average annual earnings of all workers in this group were $13,800, with the 17% who worked full time for the whole year making average annual earnings of $23,400. The respective all-occupation averages were $27,900 and $39,400.

Tour and travel guides represent about 86% of the workers in this group, with outdoor sport and recreational guides accounting for the remaining 14%. The average earnings for the small proportion of workers who were employed full time, full year are about the same for these two types of guides. However, the average annual earnings for all tour and travel guides ($12,900) were slightly lower than those for outdoor sport and recreational guides ($15,300). According to a recent survey of college graduates who found work as tour and travel guides, the average earnings were $1,780 per month, with an average of 36 hours worked per week. The average earnings for those who found work as outdoor sport and recreational guides were higher, at $2,360 per month, with an average of 46 hours worked per week. It is also worth noting that some guides will receive meals from their employers, and others, particularly outdoor guides, may have low or subsidized living costs while on tour.

The total number of employed workers in this occupational group in 1998 was 5,600, more than double the 2,770 who were employed in 1990.

About 22% of this group are self-employed (13% for tour and travel guides, 35% for outdoor sport and recreational guides), which is higher than the all-occupation average of 15%. About 29% work part time, which is slightly higher than the all-occupation average of 26%. The seasonal nature of these tourism-driven occupations is reflected in the high proportion (80%) of this group who work for only part of the year. The proportion of part-year work is similar for both types of guides. In addition, the rate of unemployment is higher than the average for all occupations.

Given the high level of seasonality, it is becoming more common for some workers in these areas to seek employment outside Canada in the off-season. For example, mountain guides may work in New Zealand and Australia during B.C.'s winter, and kayaking guides may work the spring season in the Baja or Belize.

Most tour and travel guides work in other business services (60%), with other service industries and transportation also being significant employers. The majority of outdoor sport and recreational guides either work in accommodation and food services (32%) or in the personal and household services industry (28%). Amusement and recreational services is also a significant employer for outdoor sport and recreational guides.

The geographic distribution of workers for these two groups of guides is significantly different. The pattern for tour and travel guides tends to be similar to the pattern for all occupations, with a higher than average emphasis on Victoria. About 58% of the workers are located in the Lower Mainland, 14% in the Okanagan/Kootenay region, 8% in Northern B.C., 13% in Victoria and 7% on the rest of Vancouver Island. In contrast, the pattern for outdoor sport and recreational guides emphasizes the non-urban areas. About 25% are located in the Lower Mainland, 24% in Northern B.C., 20% in the Okanagan/Kootenay region, 6% in Victoria and 23% on the rest of Vancouver Island.

Women account for 41% of all the workers in this group, making up the majority (57%) of tour and travel guides, but only 13% of outdoor sport and recreational guides.

The popularity of tour and travel guide work among young people as a means of travelling or meeting people is reflected in the age distribution of this occupational group. About 60% of the workers in the entire group are aged 15 to 34, and 26% of the tour and travel guides are between 15 and 24 years of age. By comparison, 40% of the B.C. workforce is under 35, and only 15% are under 25. The greater level of experience and expertise needed to be an outdoor sport or recreational guide is reflected in an age distribution that is closer to that of the all-occupation average. The average age of tour and travel guides is 34, and it is 37 for outdoor sport and recreational guides.

Employment Prospects

This is a large occupational group, made up of about 5,600 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment for this group to grow at an annual rate of 2.1%, faster than the average for all occupations. According to this projection, 3,350 positions will become available from 1998 to 2008. Most of these openings (62%) are projected to come from the need to replace workers who retire. The remainder will come from growth in the number of new jobs. Some additional openings will become available due to worker turnover.

A rapidly growing tourism sector is the main source of employment growth for this occupational group. According to Tourism B.C., nearly twenty-two million overnight visitors who visited B.C. in 1998 spent $8.8 billion, an increase of 3.5% from 1997. Most of these visitors were from the U.S. The weak Canadian dollar is expected to continue to attract a growing number of U.S. and European tourists to B.C. Canadian travelers will also have an added incentive to travel domestically, and B.C. is a popular tourist destination in Canada. An additional indicator that tourism in B.C. is on the rise is that about 8.5% more tourists came to B.C. on cruise ships in 1999 than in 1998. The increase in tourism is largely responsible for the astonishing 28% increase in hotel rooms in the greater Vancouver area from 1996 to 2000. Despite this increase in the number of hotel rooms, industry sources indicate that shortages of rooms exist during peak summer seasons.

There are two occupations within this occupational group, *tour* and *travel guides* and *outdoor sport* and *recreational guides*. Although employment of *tour* and *travel guides* is only expected to grow at an average rate, because of the large size of this occupation, it is expected to account for 81% of the total projected openings. Some overseas visitors travel in tour groups, which often use guides from their countries of origin because of language needs. Most Canadian and American vacationers, however, do not travel as part of a tour group.

There will be greater job growth for *outdoor sport* and *recreational guides* because of the growing interest in adventure tourism and active vacations. However, because outdoor sport and recreational guides are a very small occupational group, their projected annual growth rate of 4.2% will result in only 390 new job openings from the year 1998 to 2008. Another 270 jobs will result from replacement needs. Outdoor sport and recreational guides usually work on a seasonal basis. A substantial proportion of outdoor guides are self-employed, creating their own business and opportunities in a recreation field or location with which they are familiar.

Additional Information

Pacific Rim Institute of Tourism http://www.prit.bc.ca

Related Occupations

tour and travel guides (6441):

- museum guides and historical and heritage interpreters (in 521 technical occupations in libraries, archives, museums and galleries)
- tour operators (in 01/09 middle and other management)

outdoor sport and recreational guides (6442):

- program leaders and instructors in recreation and sport (in 525 athletes, coaches, referees and related occupations)

Occupations in Food and Beverage Service

NOC 645

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	35,470	42,640	55,340

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
12,700	2,100	14,800

Annual Growth 1998-2008 2.6%

Main Industries of Employment

Accommodation and Food Services	93%
Amusement and Recreation Services	3%
Retail Trade	1%

Employment by Region

Lower Mainland	54%
Vancouver Island	19%
Northern B.C.	9%
Okanagan/Kootenay	18%

Self-employment 2%

Nature of the Work

Maîtres d'hôtel and *hosts/hostesses* greet patrons and escort them to tables as well as supervise and coordinate the activities of food and beverage servers. They are employed in restaurants, hotel dining rooms, private clubs, cocktail lounges and similar establishments.

Bartenders mix and serve alcoholic and non-alcoholic beverages. They are employed in restaurants, hotels, bars, taverns, private clubs, banquet halls and other licensed establishments. Supervisors of bartenders are included in this unit group.

Food and beverage servers take patrons' food and beverage orders and serve orders to patrons. They are employed in restaurants, hotels, bars, taverns, private clubs, banquet halls and similar establishments.

Main Duties

Maîtres d'hôtel and *hosts/hostesses* receive and record patrons' reservations and assign tables, greet patrons at the entrance of the dining room, restaurant or lounge and escort them to tables or other seating areas. They speak with patrons to ensure satisfaction with food and service, they inspect dining and serving areas for cleanliness, and they supervise and coordinate activities of food and beverage servers and other serving staff. They also attend to complaints, accept payment from patrons for food and beverage, prepare work schedules and payrolls, interview candidates for food and beverage server positions, and train new employees.

Bartenders take beverage orders from serving staff or directly from patrons. They mix liquor, soft drinks, water and other ingredients to prepare cocktails and other drinks. They also prepare mixed drinks, wine, draft or bottled beer and non-alcoholic beverages for food and beverage servers, or they serve beverages directly to patrons. Bartenders collect payment for beverages and record sales, maintain inventory and control of bar stock, order supplies, clean the bar area and wash glassware. They may supervise other bartenders and bar staff.

Food and beverage servers greet patrons, present menus, make recommendations and answer questions regarding food and beverages. They take orders, which they relay to kitchen and bar staff, recommend beverages that complement patrons' meals and serve food and beverages. They also prepare and serve specialty foods at patrons' tables, present bills to patrons and accept payment.

©Stone/Vancouver

Example Titles

maîtres d'hôtel and hosts/hostesses (6451):
- maître d'hôtel
- maître d'
- restaurant host/hostess

bartenders (6452):
- head bartender
- barkeeper

food and beverage servers (6453):
- apprentice food and beverage server
- banquet server
- chief wine steward
- captain food server
- wine steward
- cocktail server
- waiter/waitress
- fine dining server

Education and Training

Formal preparation for these jobs is becoming increasingly important as B.C.'s food service industry grows in complexity. Although there is no minimum educational requirement, completion of grade 10 is usually preferred, and many employers hire high school graduates. On-the-job training is usually provided. Completion of a two- to three-month waiter/waitress or dining room and lounge service training program is an asset.

Restaurants with a complex level of service usually require training and experience as a counter person, bus person or kitchen helper prior to employment in a service capacity. Hosts and hostesses usually require experience as waiters and waitresses. Maîtres d'hôtel and wine stewards usually require experience as formal or captain waiters and waitresses or other relevant food service experience. Bartenders usually complete a college or other program in bartending, although some may find work as assistants or bar porters and be promoted to bartending. For those who want to move into management, completion of a hotel/restaurant management program or a dining room and lounge supervisor program is advisable. Most colleges offer programs in hospitality and tourism management.

North Island College offers a five-week Professional Food and Beverage Service program designed for those entering or working in the industry. North Island also offers a 99-hour Professional Bartending program that prepares graduates to obtain a "Serving It Right" certificate, required by all people who serve alcohol in B.C. Okanagan University College offers an 80-hour bartending program. Graduates receive their certificate after they complete the "Serving It Right" training, which can be done either through Okanagan or by correspondence.

Vancouver Community College (VCC) offers a number of programs in this area. Three-month Dining Room and Lounge Service programs are offered at both basic and advanced levels. Applicants to the basic program must have grade 10 or equivalent, and applicants to the advanced program must have completed the basic program or an equivalent. Both University College of the Cariboo and VCC offer Food and Beverage Management certificates. This is a ten-month program for which applicants must have grade 12 or equivalent. An eight-month Food and Beverage Service program is offered for those who wish to incorporate English as a Second Language instruction into their program at VCC. Those who apply for this program must have some degree of English language skill. Proven good health is required to be accepted into any of these programs.

Certification is available, but not mandatory, for bartenders and for food and beverage servers. Certification is granted by the Association of Tourism Professionals arm of the Pacific Rim Institute of Tourism, following a written examination, a skill review and an evaluation by a trained volunteer. Certification acknowledges that a person has the level of knowledge, skills and attitude acceptable by industry standards. The Institute can be contacted at 800 - 1185 West Georgia Street, Vancouver, B.C., V6E 4E6 or call (604) 682-8000 or fax (604) 688-2554.

Both Selkirk College and VCC offer the Institutional Aide, certificate which provides students with the training necessary for employment as kitchen helpers, cleaners or housekeeping and laundry aides in restaurants, long term care facilities and commercial laundries. Applicants must have good reading, writing and basic arithmetic skills and be in good health.

For a description of programs that allow entry into this area of work at a supervisory level, please refer to the profile Sales and Service Supervisors (621).

Workers in these professions require a pleasant personality and a neat and clean appearance. They should be sensitive to people's needs. They must be able to organize, plan and work as part of a team. They need good memories and must be good communicators. Good stamina is necessary since they are usually on their feet and required to work quickly as well as efficiently. Knowledge of basic mathematics and comfort with computers is important. Those who serve alcohol must be 19 years old and should have good judgement and an ability to deal with difficult people. Bartenders must be fairly strong because they are often required to do heavy lifting. All people in this field should be prepared to work irregular and sometimes late hours. An awareness of safety and emergency issues is important.

Working Conditions

Much of the work for this occupational group is part time, and workers should expect to work some evenings, weekends, holidays or even split shifts (for example, work several hours during lunch period, take a few hours off and then work several hours more during the dinner period).

Most workers are in constant contact with customers, so they should be prepared to interact with various personalities, including those that are demanding or difficult. During busy periods they are under pressure to serve customers quickly and efficiently. *Food and beverage servers* should have reasonable physical stamina for carrying heavy trays and plates of food while staying on their feet for extended periods.

Food and beverage servers derive their earnings from a combination of hourly wages and customer tips. Their wage rate and the amount of tips they receive vary with the type of work and establishment. For instance, *maîtres d'hôtel* and *hosts/hostesses* generally do not receive tips, so their wage rates may be higher than those of food and beverage servers. In some establishments servers contribute some of their tips to a tip pool, which is distributed among other food and beverage service workers and kitchen staff. Tip pools enable workers who normally do not receive tips to share in the rewards for meals well served.

Bartenders also receive higher wage rates than waiters and waitresses in most cases. Bartenders in public bars may also receive tips, either from direct service or through a tip jar. Those working as service bartenders are often paid higher hourly wages to offset their lower tip earnings.

Food and beverage servers at fast-food outlets are usually paid minimum wage rates and do not receive tips. Earnings from both wages and tips tend to be higher at fine-dining restaurants and upscale hotels.

In some large restaurants and hotels, food and beverage service workers belong to unions, so they may receive higher wages. For example, food and beverage service workers at the Four Seasons Hotel in Vancouver are members of the Hotel, Restaurant and Culinary Employees and Bartenders Union, Local 40. The hourly wage rates for the lounge department at the Four Seasons (effective March 1, 1996) paid to workers after one year of employment were $14.61 for a First Bartender (service), $11.55 for a First Bartender and $10.59 for a Server. Hourly wage rates for the fine dining room, room service and restaurant/coffee shop departments at the Four Seasons (effective March 1, 1996) were $13.05 for a Cashier, $12.41 for a Host/Hostess (food) and $9.29 for a Server. These example wage rates are for union workers and apply to a large hotel in Vancouver, but workers in much of the province will earn lower wage rates.

In 1995 the average annual earnings were $9,800 for maîtres d'hôtel, $9,800 for food and beverage servers and $14,300 for bartenders. These averages appear to be low, but they reflect the relatively high proportion of individuals who worked part time or part year in these occupations. Those who worked full time for the whole year as maîtres d'hôtel (21%) earned an average of $19,400. Those who worked full time, full year as food and beverage servers (22%) earned an average of $16,100. And those who work full time, full year as bartenders (35%) earned an average of $20,000. The comparable all-occupation average annual earnings were substantially higher, at $27,900 for all workers and $39,400 for full-time, full-year workers. However, it must be remembered that this is an occupational group in which tipping is common and may not always be fully reflected in reported earnings.

In addition, a recent survey of college graduates who found work in this occupational group reported that maîtres d'hôtel earned an average of $900 per month, based on 25 hours worked in a week, food and beverage servers earned an average of $1,020 per month, based on 27 hours worked in a week, and bartenders earned an average of $1,210 per month, based on 28 hours worked in a week.

The number of employed workers increased 20% (7,170 workers) from 35,470 in 1990 to 42,640 in 1998. Food and beverage servers represent 78% of these workers, and the growth in this occupation accounted for 84% of the total increase. As for the rest of the people in this occupational group, bartenders represent 14%, and maîtres d'hôtel represent the final 8%. Only 2% of this entire group is self-employed, but half (52%) work part time. Bartenders are an exception within this group, with only 37% working part time. Nonetheless, even among bartenders the level of part-time work is well above the provincial average of 26%. The rate of unemployment for this entire group is about the same as the average for all occupations.

Seasonal employment typifies these occupations. The proportions for those who work for only part of the year are 65% for maîtres d'hôtel, 63% for food and beverage servers and 52% for bartenders. This compares with only 45% for the workforce as a whole. However, it is worth noting that there is a growing trend toward developing year-round tourism activity in specific regions of the province. For example, Vancouver is now being marketed as an active centre for the performing arts, a host for cultural and sporting events and a starting point for Alaska cruises, as well as a gateway to tourism around the province. Similarly, Whistler has developed a substantial level of visitation during the summer months to complement the high volume of tourists drawn by its world class reputation as a winter destination resort. These changes increase the level of business for hotels, restaurants and other services in the off-season, which in turn leads to increased demand for workers in food and beverage service occupations.

Over 90% of the workers in this occupational group are employed in the accommodation and food services industry. Much like the averages for all occupations, about 54% of these workers are located in the Lower Mainland, 19% are on Vancouver Island, 18% are in the Okanagan/Kootenay region, and 9% are in Northern B.C.

This occupational group is dominated by women. Women account for 89% of maîtres d'hôtel, 79% of food and beverage servers and 56% of bartenders.

Workers in this group are exceptionally young. Those workers aged 15 to 34 represent 73% of the maîtres d'hôtel, 77% of food and beverage servers and 62% of bartenders. This compares with an all-occupation average of 40%. In addition, 55% of maîtres d'hôtel and 47% of food and beverage servers are under 25, compared to an all-occupation average of just 15%. The average age is 28 for both maîtres d'hôtel and food and beverage servers. Bartenders tend to be a bit older, with an average age of 33. Many of the younger workers are students working part time after school or university, or full time for part of the year during school and university holidays. Serving and bartending (bartenders must be at least 19 years old) are typical ways younger Canadians support themselves while completing their education. However, older workers also find careers in these occupations.

Employment Prospects

This is a very large occupational group, made up of about 42,640 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment for this group to grow at an annual rate of 2.6%, much faster than the average for all occupations. According to this projection, 14,800 positions will become available from 1998 to 2008. Most of these openings (86%) will come from growth in the number of new jobs. The remainder will come from the need to replace workers who retire. Many additional openings will become available due to a high rate of worker turnover.

Employment in each of the three occupations within this occupational group are projected to grow at roughly the same rate. Differences in the sizes of these occupations will determine how many of the total projected openings will be accounted for by each occupation. *Food and beverage servers* is the largest occupation and will account for 77% of the openings. *Bartenders* will account for 14%, and the remaining 9% will open for *maîtres d'hôtel* and *hosts*.

Rapid employment growth in the accommodation and food services industry, which employs almost all of these workers (over 90% in 1998), is responsible for the high employment growth of these occupations. There are a number of factors driving growth in this industry. Increases in the number of double income families have led to both higher incomes and less time available to prepare meals at home. These factors have contributed to families eating out more regularly. A rapidly growing tourism sector is also contributing to growth in this industry. According to Tourism B.C, nearly twenty-two million overnight visitors visited B.C. in 1998, an increase of 3.5% from 1997. The weak Canadian dollar is expected to continue to attract a growing number of U.S. and European tourists to B.C. Canadian travelers will also have an added incentive to travel domestically, and B.C. is a popular tourist destination in Canada. According to industry sources, about 8.5% more tourists came to B.C. on cruise ships in 1999 than in 1998, and 75% of these tourists deemed eating in restaurants to be a favourite activity.

Limited formal education and training requirements allow for easy entry, which makes these occupations attractive, especially for young people who work part time while they are at college or university. The abundance of part-time work is also attractive to those seeking an immediate source of income rather than a career. There is substantial movement out of this field as workers switch to other occupations or as they stop working, either to attend school or to assume household responsibilities.

There will be an abundance of entry-level work available for food and beverage servers as well as ample opportunities for higher-paid, career-track positions. These career opportunities will go to applicants with more experience and a confident, outgoing manner. Competition will be particularly keen for work in fine-dining establishments, where potential earnings and advancement are greatest.

As the hospitality industry in B.C. grows more sophisticated, so too will the demand for those with higher levels of skill in customer service and social interaction. In order to have access to better-paying, full-time career positions, workers should have good work records and advanced social skills. Workers should also consider obtaining national occupational certification.

Workers in this occupational group are recruited through word-of-mouth from existing workers, advertisements and employment agency referrals. Progression to supervisory positions in food and beverage service is possible with experience, especially as an internal promotion within a restaurant chain.

Additional Information

For *bartenders* and *food and beverage servers*
Canadian Tourism Human Resource Council
http://www.cthrc.ca

Pacific Rim Institute of Tourism http://www.prit.bc.ca

Related Occupations

maîtres d'hôtel and hosts/hostesses (6451):
- food service supervisors (in 621 sales and service supervisors)

food and beverage servers (6453):
- restaurant and food service managers (in 01/09 middle and other management)

Other Occupations in Protective Service

NOC 646

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	4,850	5,850	6,670

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
820	1,600	2,420

Annual Growth 1998-2008 1.3%

Main Industries of Employment

Provincial and Territorial Administration	26%
Federal Administration	22%
Local and Other Administration	16%

Employment by Region

Lower Mainland	44%
Vancouver Island	41%
Northern B.C.	7%
Okanagan/Kootenay	8%

Self-employment 3%

Nature of the Work

This occupational group includes five unit groups, *sheriffs* and *bailiffs* (6461), *correctional service officers* (6462), *by-law enforcement* and *other regulatory officers*, not elsewhere classified (6463), *occupations unique to the armed forces* (6464) and *other protective service occupations* (6465).

Sheriffs and *bailiffs* enforce court orders, serving writs, summonses and seizures of property. They are employed by the provincial courts or may be self-employed.

Correctional service officers guard prisoners and detainees and maintain order in correctional institutions and other places of detention. They are employed by federal, provincial and municipal governments.

By-law enforcement and *other regulatory officers* enforce by-laws and regulations of provincial and municipal governments. They are employed by provincial and municipal governments and agencies.

Occupations unique to the armed forces include personnel, such as soldiers in armour, artillery, infantry, airborne and maritime branches, who provide collective defense measures to protect Canadian waters, land, airspace and other interests. They are employed by the Canadian Armed Forces. (Please note that the employment estimates, employment projections and industry employment estimates reported in this occupational profile do not include this occupational group. Those who work in the armed forces are excluded from Statistics Canada's Labour Force Survey, the data source for the Canadian Occupational Projection System.)

Workers in *other protective service occupations* conduct private investigations for clients or employers, implement security measures to protect property against theft and fire and provide other protective services. They are employed by security and investigation service companies, hotels, retail establishments, businesses and industry, or they may be self-employed.

Main Duties

Sheriffs and *bailiffs* serve statements of claims, summonses, jury summonses, orders to pay alimony and other court orders. They serve writs of execution by seizing and selling property and distributing the proceeds according to court decisions. They locate property and make seizures and removals under various acts of Parliament. Sheriffs and bailiffs also provide courthouse security for judges and assist in maintaining order. They escort prisoners to and from courts and correctional institutions. They also attend court, escort witnesses and prepare reports and affidavits.

Correctional service officers observe conduct and behaviour of prisoners to prevent disturbances and escapes. They supervise prisoners during work assignments, meals and recreation periods and they escort prisoners in transit and during temporary leaves. They also patrol assigned areas, report any problems to a supervisor and prepare admission and other reports. They may supervise and coordinate the work of other correctional service officers.

By-law enforcement and *other regulatory officers* enforce adherence to a wide variety of laws, regulations, policies and procedures that protect the public on different matters. Animal control officers respond to citizen complaints concerning stray domestic animals, livestock and wildlife. Further, they issue warnings and citations to owners, as well as impound lost, homeless and dangerous animals. By-law enforcement officers enforce municipal and provincial regulations, investigate complaints, and issue warnings and citations to commercial and residential property owners and occupants. Commercial transport inspectors inspect commercial vehicles to ensure compliance with regulations governing load restrictions, the transportation of hazardous materials and public safety.

Garbage collection inspectors investigate complaints concerning infractions of garbage collection by-laws. *Liquor licence inspectors* conduct inspections of licensed establishments, advise licensees on laws and regulations, and report contravention of laws and regulations to provincial liquor control boards and agencies. *Parking control officers* enforce parking by-laws on city streets, regional roads and municipal properties. *Taxi inspectors* inspect taxicabs for mechanical reliability, cleanliness, licensing and meter accuracy. They investigate public complaints, issue summonses and prepare reports. They also give evidence to city councils, taxi commissions and in court.

Personnel in *occupations unique to the armed forces* operate armoured vehicles, artillery, hand-held weapons and other military combat equipment and defence systems. In addition, they engage in peacekeeping operations and enforce ceasefire agreements. They provide aid in emergency situations, such as civil disorder, natural disasters and major accidents. They also engage in drills and other training in preparation for peacekeeping, combat and natural disaster relief duties as well as performing administrative and guard duties.

Workers in other protective service occupations include corporate security officers who investigate unlawful acts of employees or patrons of establishments and recommend security systems, such as electronic detection devices and access devices. They include private investigators who conduct investigations to locate missing persons and obtain information for use in civil and criminal litigation matters or for other purposes. Included as well are retail loss prevention officers who prevent and detect shoplifting and theft in retail establishments.

Example Titles

sheriffs and bailiffs (6461):
- sheriff
- bailiff
- deputy sheriff
- sheriff's officer

correctional service officers (6462):
- correctional facility guard
- supervisor, correctional officers
- detention attendant
- correctional service officer
- prison guard

by-law enforcement and other regulatory officers, n.e.c. (6463):
- property standards inspector
- garbage collection inspector
- zoning inspector
- taxi inspector
- animal control officer
- commercial transport inspector
- liquor licence inspector
- by-law enforcement officer
- parking control officer

occupations unique to the armed forces (6464):
- air defence technician
- armoured vehicle crew member
- artillery soldier
- assault pioneer
- field engineer
- infantry soldier
- naval weapons technician
- sonar operator
- tank driver
- weapons operator

other protective service occupations (6465):
- corporate security officer
- retail loss prevention officer
- security officer, private
- postal inspection officer
- private investigator
- alarm investigator
- house detective
- security consultant
- store detective

Education and Training

People in this field usually need high school graduation, and for some positions, completion of a college diploma in an area such as criminology is necessary. On-the-job training is sometimes provided. Workers in *protective service* generally must have a good knowledge of fire prevention, first aid, building safety and emergency procedures. Medical and security clearances are often required. Self-defense training can be an asset. Depending on the position, workers may need to be bondable and have a valid B.C. driver's licence. Extensive experience working with people is an asset.

Some positions in this employment field require specialized training or experience. Military personnel undergo three months of basic training and education in operation and maintenance of military equipment. The Justice Institute of British Columbia offers a six-week Deputy Sheriff pre-employment program. Sheriffs require experience as bailiffs or deputy sheriffs.

Those who wish to become provincial or municipal corrections officers may complete an employment readiness program offered by the Justice Institute of British Columbia and, as well, must have a valid driver's licence and current first aid certificate. Application to the Institute requires completion of grade 12 or equivalent, submission of references and a criminal record check and includes personal testing and interviews. Applicants should have good communication skills, a willingness to follow policy and procedures and an ability to deal with stressful situations.

The University College of the Cariboo (UCC) offers a nine-month Corrections certificate, one of three human service certificates offered at UCC. Applicants must have grade 12 or equivalent, be in good physical and medical health and undergo interviews.

For information regarding work in federal corrections, see the profile Probation and Parole Officers and Related Occupations (4155).

Several colleges offer one- and two-year programs in criminal justice/criminology to prepare graduates for employment in corrections and private security. For a review of these programs, see the profile Police Officers (6261). Grade 12 or equivalent is the minimum educational requirement for admission to these programs.

Employers look for people without a police record who are mature and dependable and have good character references. These workers should be mentally alert, emotionally stable, self-confident and physically fit and have good hearing and vision. An ability to follow instructions, good oral and written communication skills, knowledge of computerized systems and an ability to react quickly to unexpected events are also important. A willingness to work shifts and weekends may be necessary, and these workers should be able to work independently or as part of a team, as necessary. Individuals considering a career in the armed forces should be loyal, ambitious and self-disciplined.

Working Conditions

This group includes a variety of occupations involving population security and safety, property protection and enforcement of by-law and other regulatory measures. There are some common characteristics to these occupations because they are all related to protective services. However, the working conditions are rather different for each occupation.

Sheriffs and *bailiffs* work inside court buildings where they provide security for judges and keep order in the court room. They also spend much of their time traveling while escorting prisoners and witnesses and while serving court orders. They are exposed to stress, traffic and weather conditions. They must behave with tact and authority as they assume their duties, including seizures of property.

Correctional service officers may work indoors or outdoors, depending on their specific duties. Some indoor areas are well lighted, heated and ventilated, but others are overcrowded, hot and noisy. Outdoor weather conditions may be disagreeable, for example when standing watch on a guard tower in cold weather. Working in a correctional institution can be stressful and hazardous. Correctional officers occasionally have been injured or killed during inmate disturbances. Correctional officers usually work a 7.5 hour day, 5 days a week. Prison security must be provided around the clock, which means some officers work weekends, holidays and nights. In addition, officers frequently may be required to work overtime.

By-law enforcement and *other regulatory officers'* duties vary widely depending upon their employer. They may work individually or in teams under supervision. They meet people and work in a variety of environments. They are often exposed to field work, and some of them travel frequently. They are often furnished with an automobile or are reimbursed for travel expenses. They may experience unpleasant or dangerous working conditions. For instance, garbage collection inspectors frequently come in contact with strong, unpleasant odours. Inspectors engaged in some form of police work may find themselves in adversarial roles when the group being inspected does not want them there.

Working conditions for people in *occupations unique to the armed forces* can vary substantially depending on their responsibilities. Life in the Canadian Armed Forces is much more regimented than civilian life, and one must be willing to accept the discipline. It is important to remember that enlisted military personnel are obligated to serve for a specific period of time. However, the armed forces increasingly are depending on reserve personnel. Dress and grooming requirements are more stringent than in most civilian occupations, and rigid formalities govern many aspects of everyday life. Rules encourage respect for superiors whose commands must be obeyed immediately and without question.

Hours of work can vary, but most military personnel usually work 7.5 hours a day, 5 days a week. Some assignments call for night and weekend work or require workers to be on call at all hours. Those aboard ships and those on air crews travel regularly, while others in the armed forces are stationed at bases throughout Canada or in other countries. Lengthy overseas assignments in countries offering few amenities are possible. Some work is in isolated areas subject to extreme cold or heat. Other work is hazardous, even in noncombat situations.

During times of conflict, many may find themselves in life and death situations. Countless hours of training produce teamwork that is highly critical to the success or failure of an operation. In addition, rapidly advancing military technology has made warfare more precise and lethal, further increasing the need for teamwork.

Other protective service occupations include a variety of security-related occupations with different working conditions. The workplace may be a shopping centre, a retail store, an industrial plant or any other place where protection and investigation is needed. Work for many of these occupations is carried out inside for the most part. But some occupations, such as private investigators, involve outside work and travel. People in these occupations are sometimes exposed to dangerous situations when assuming their duties. Working hours may be regular, or they may vary. For example, store detectives must work during the store's business hours.

Unfortunately, there is no Statistics Canada Labour Force Survey data available for the subgroup "Occupations Unique to the Armed Forces," and therefore the statistics detailing the number employed in 1990 and 1998, employment projections (found in the "Employment Prospects" section) and employment by industry exclude this occupation. However, apart from these three areas, the rest of the following statistics encompass all of the subgroups in "Other Occupations in Protective Service."

The estimated number of employed workers in these occupations (excluding those in occupations unique to the armed forces) rose 21%, from 4,850 in 1990 to 5,850 in 1998. The 1996 Census data show that 5,060 persons worked in 1995 in occupations unique to the armed forces. However, CFB Chilliwack was closed in 1998, and in the absence of current Labour Force Survey data, it may be assumed that the number of workers employed in occupations unique to the armed forces in 1998 would be roughly 4,000. As a result, those in occupations unique to the armed forces account for 27% of all workers, correctional service officers account for 27%, bylaw enforcement and other regulatory officers account for 17%, sheriffs and bailiffs account for 8%, and those in other protective service occupations account for the final 13%.

In 1995 the average annual earnings in this occupational group for the 69% of workers who worked full time, full year were $38,800, with an average of $33,100 for all workers. Average full-time, full-year earnings were lowest for *other protective service occupations* ($35,900), with an average of $27,900 for all workers. Average full-time, full-year earnings were highest for *correctional service officers* ($41,500), with an average of $39,400 for all workers. According to a recent survey of college graduates who found work in this occupational group, the average earnings were lowest for other protective service occupations ($1,690 per month or $20,200 per year) and highest for *sheriffs* and *bailiffs* ($2,780 per month or $33,400 per year).

The degree of self-employment varies slightly across these occupations. By-law enforcement and other regulatory officers have little self-employment (1%), and it is non-existent for correctional service officers and those in occupations unique to the armed forces. However, 8% of sheriffs and bailiffs and 17% of those in other protective service occupations report being self-employed. By comparison, the rate of self-employment across all occupations in B.C. is 15%. Unemployment for each of the occupations in this group is lower than the average for all occupations in B.C.

The work pattern for all occupations in this group is reasonably consistent. Overall, 88% of the workers are employed full time, with 69% being employed full time for the whole year, and 19% being employed full time for part of the year. The level of full-time employment is higher than the all-occupation average of 74%. Overall, 12% of all workers are employed part time, but 20% of those in other protective service occupations work part time. This is below the provincial average of 26%. Finally, 27% of these workers are employed for part of the year, compared to 45% for the workforce as a whole.

The largest concentrations of workers in this occupational group are employed in provincial and territorial administration (26%), federal administration (22%) and local governments (16%), but a good number are also employed in other business services and in retail trade. (These industry statistics exclude those in occupations unique to the armed forces. They represent about 46% of all the workers and are, of course, employed by the federal government.)

The regional distribution of workers is different for those in occupations unique to the armed forces than for the rest of the workers in this occupational group. Overall the distribution of non-military workers tends to resemble the average for the workforce as a whole. About 60% are located in the Lower Mainland, 17% are on Vancouver Island, 12% are in the Okanagan/Kootenay region, and 11% are in Northern B.C. As for those workers in occupations unique to the armed forces, the 1996 Census data suggest that 69% are on Vancouver Island, 25% are in the Lower Mainland, 3% are in the Okanagan/Kootenay region, and 3% are in Northern B.C. However, the closure of CFB Chilliwack in 1998 will mean an even larger emphasis on Vancouver Island as the location for most of these workers.

Women make up 27% of the non-military workers in this group and only 14% of the workers in occupations unique to the armed forces. The age distribution also differs for military and non-military workers. Those in occupations unique to the armed forces tend to be younger than the all-occupation average. In particular, 47% of the workers are aged 24 to 34, compared to 25% for the workforce as a whole. The average age is 33, compared to 38 for the all-occupation average. The rest of the workers in this occupational group tend to be slightly older than the all-occupation average. Only 7% of these workers are under 25, compared to 15% for the workforce as a whole. The average ages were 38 for sheriffs and bailiffs, 41 for correctional service officers, 42 for bylaw enforcement and other regulatory officers and 39 for those in other protective service occupations.

Employment Prospects

This is a large occupational group, made up of about 5,850 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment for this group to grow at an annual rate of 1.3%, slower than the average for all occupations. According to this projection, 2,420 positions will become available from 1998 to 2008. Most of these openings (66%) will come from the need to replace workers who retire. The remainder will come from growth in the number of new jobs. Some additional openings will become available from worker turnover.

Employment in each of the four occupations within this occupational group differs in size and rate of growth. Consequently the number of projected openings that are accounted for by each occupation will also differ. Employment of *correctional service officers* is both the slowest growing and largest occupation, accounting for 37% of the projected openings. *Other protective service occupations* are projected to grow at an average rate and account for 34% of the openings. *By-law enforcement officers* are projected to grow faster than any other occupation within this group and account for 21% of the openings. The remaining 8% of the total projected openings are projected to open for *sheriffs* and *bailiffs*.

Almost 64% of all workers in this occupational group were employed by various levels of government in 1998. Budget concerns at all levels of government are expected to limit the growth in employment of these workers, particularly for *correctional service officers* due to their concentration in the federal and provincial government. *Other protective service occupations* are relatively unaffected by this due to their concentration in the other business services industry.

An increasing public perception and concern over rising crime rates ultimately may override government cutbacks and staff reductions. Budgetary concerns also may increase the proportion of law enforcement dollars spent on workers in this occupational group.

Technology is expected to create new demands and ways of working and may require that workers have additional skills and knowledge.

It is difficult to predict whether or not the trend of the 1990s toward reducing employment in occupations unique to the armed forces will continue. The Canadian army is currently in the process of developing a "modernization plan" that is expected to reduce the number of soldiers in its ranks. However, there are two other factors that suggest a growing number of openings for these workers. First, peace keeping missions have been on the rise in recent years. Second, the Department of National Defence has received its second consecutive increase in its budget following Finance Minister Paul Martin's 2000 Budget Speech.

Positions in this field could be used to acquire valuable work experience. According to industry sources, progression to parole officers and related occupations in the wider field of correctional services probation is possible with additional education.

(Please note that the employment estimates, employment projections and industry employment estimates reported in this occupational profile do not include *occupations unique to the armed forces*. Those who work in the armed forces are excluded from Statistics Canada's Labour Force Survey, the data source for the COPS.)

Additional Information

For *deputy sheriffs*
Justice Institute of B.C. http://www.jibc.bc.ca

Related Occupations

- court clerks (1443)
- police officers (except commissioned) (6261)
- social workers (4152)
- probation and parole officers and related occupations (4155)
- detention home workers (in 4212 community and social service workers)
- engineering inspectors and regulatory officers (in 226 other technical inspectors and regulatory officers)
- police officers (6261)
- military police officers (in 6261 police officers)
- musicians - military (in 513 creative and performing artists)
- vehicle technicians - military (in 732 motor vehicle mechanics)
- security guards and related occupations (in 665 security guards and related occupations)

Early Childhood Educators and Assistants*

NOC 6470

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	8,550	14,140	15,740

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
1,600	3,220	4,820

Annual Growth 1998-2008	1.1%
Main Industries of Employment	
Other Health and Social Services	89%
Personal and Household Services	4%
Education	3%
Employment by Region	
Lower Mainland	56%
Vancouver Island	21%
Northern B.C.	9%
Okanagan/Kootenay	14%
Self-employment	29%

Nature of the Work

People in this occupational unit are employed in day-care centres and nursery schools.

Early childhood educators plan and organize activities for pre-school children and lead children in these activities to encourage their intellectual, physical and emotional growth. Early childhood educators who are supervisors are included in this group.

Early childhood educator assistants supervise pre-school children, and under the supervision of an early childhood educator, they facilitate children in activities to stimulate and develop their intellectual, physical and emotional growth. They are employed as trainees while enrolled in a recognized post-secondary training program.

Technical note: In data provided by Statistics Canada and reported here in *Work Futures*, NOC (National Occupation Classification) code unit group 4214 (early childhood educators) and NOC unit group 6473 (early childhood educator assistants) are combined to form SOC (Standard Occupational Classification) 1991 unit group 6470 (early childhood educators and assistants). For more information, see the Technical Notes Appendix. Individuals who provide care for children in private homes are covered under babysitters, nannies and parents' helpers (see profile 6474).

WINTER WONDERLAND

©Stone/Vancouver

Main Duties

Early childhood educators develop daily activities for children. They lead children in activities by telling or reading stories, teaching songs, demonstrating the use of simple musical instruments, preparing craft materials and demonstrating their use, and taking the children to local points of interest. They guide and assist children in the development of proper eating, dressing and toilet habits. They also observe children and discuss, when appropriate, children's progress or problems with parents and other staff members. They attend meetings and workshops to develop and discuss new teaching methods. They may supervise and coordinate the activities of other early childhood educators and early childhood educator assistants.

Early childhood educator assistants supervise children in indoor and outdoor play and during rest period. They facilitate children in activities by telling stories, teaching songs and preparing craft materials. They prepare and serve snacks and facilitate children in the development of proper eating, dressing and toilet habits. They also submit written observations on children to the supervisor, attend staff meetings to discuss progress and problems of children, and assist the supervisor in keeping records. Early childhood educator assistants maintain day-care equipment and assist in housekeeping duties.

Example Titles

early childhood educators (4214):

- day-care supervisor
- day-care worker
- early childhood supervisor
- early childhood program staff
- child-care worker, day care
- pre-school supervisor
- pre-school teacher

early childhood educator assistants (6473):

- early childhood educator assistant
- child-care worker assistant

Education and Training

Completion of a certificate in Early Childhood Care and Education (ECCE) is required in order to be licensed by the provincial Child Care Facilities Licensing Board and to work as an assistant preschool or day-care supervisor. Criminal record checks are usual for those who apply to these programs. Five hundred hours of documented satisfactory work experience in a licensed program and attainment of a first aid certificate allow graduates to apply for registration as fully qualified preschool or day-care supervisors.

Most colleges and university colleges in B.C. offer ECCE certificate programs. Duration of these programs varies between 9 and 24 months for full-time students, and often part-time study is possible. Following this training, shorter programs addressing care and education for infants and toddlers and for children with special needs are usually available and allow graduates to receive a diploma in this field. Prerequisites most often required for the ECCE program include grade 12, a minimum age of 19 years, college-level writing and academic skills, proven medical fitness and recent relevant experience as an employee or volunteer in a licensed setting.

For those who wish to advance in this area, a degree may be necessary. The University of Victoria (UVic) and Malaspina University-College offer a bachelor's degree in Child and Youth Care. University College of the Fraser Valley also offers a bachelor's degree in conjunction with UVic. The Faculty of Education at Simon Fraser University (SFU) offers a bachelor's degree in education, with minor programs in early childhood education. The University of British Columbia (UBC) also offers various courses in early childhood education through the Faculty of Education. For those who wish to work as they pursue their degree, the programs are available through distance education departments. The schools have policies of allowing access by special applicants. Those interested should contact the schools for more information on prerequisites.

Early childhood educators and *assistants* should be neat in appearance, with high energy in order to work with active children. Good interpersonal and communications skills are necessary. These workers should be emotionally stable and able to interact comfortably with a wide range of people and should have a high standard of ethics. A good sense of humour is important, as well as patience and understanding.

Working Conditions

Day-care centres and nursery school facilities may be in schools, religious or community institutions, workplaces and private buildings.

Watching children grow, learn and gain new skills can be very rewarding. The work, however, can be physically and emotionally taxing, as workers constantly stand, walk, bend, stoop and lift to attend to each child's interests and problems. Preschool workers must be enthusiastic and constantly alert, anticipate and prevent problems, deal with disruptive children and provide fair but firm discipline. They must be able to communicate effectively with children and parents of diverse cultural backgrounds. Supervisors must be able to manage labour relations.

The working hours of *early childhood educators* and *assistants* vary widely. Day-care centres are generally open year round with extended hours so that parents can drop off and pick up their children before and after work. Day-care centres employ full-time and part-time staff with staggered shifts in order to cover the entire day. Many preschool programs and school-based programs operate during the school year only, employing both full-time and part-time workers.

Earnings are well below average. In 1995 the average earnings of all early childhood educators and assistants were $11,900, compared to $27,900 for all occupations. Only 30% of the workers in this group were employed full time for the full year, which compares to 47% for the workforce as a whole. These workers received an average of $18,000 in earnings, less than half of the B.C. average for all occupations ($39,400). According to a recent survey of college graduates who found work as early childhood educator assistants, the average earnings were $1,250 per month, based on 28 hours per week.

This is a very large occupational group, with an estimated 14,140 workers employed in B.C. in 1998, up 65% from 8,550 in 1990. Self-employment for this group (29%) is almost double the provincial average of 15% for all occupations. About 60% of these workers are employed on a full-time basis, and 40% work part time. However, a relatively high proportion of these workers (31%) are employed part time for part of the year, and overall 62% work for only part of the year. By comparison, 18% of the entire B.C. workforce are employed part time for part of the year, and 45% work for only part of the year.

The unemployment rate for this group is lower than the average for all occupations.

About 89% of the workers are employed in health and social services, mainly child day-care and nursery school services. A further 4% are employed in private households, many of them self-employed. The geographic distribution of workers is similar to the average for all occupations. About 56% of the workers are located in the Lower Mainland, 21% are on Vancouver Island, 14% are in the Okanagan/Kootenay region, and 9% are in Northern B.C.

Women are predominant in this field and represent 96% of all workers. Early childhood educators must be at least 19 years of age and tend to be younger than average. More than half (52%) are under 35 years of age, compared to 40% for the workforce as a whole. The average age is 35.

Employment Prospects

This is a very large occupational group, made up of about 14,140 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment for this group to grow at an annual rate of 1.1%, slower than the average for all occupations. According to this projection, 4,820 positions will become available from 1998 to 2008. About two-thirds of these openings will come from the need to replace workers who retire. The remainder will come from growth in the number of new jobs. A high rate of worker turnover will create many additional openings. This is due to low salaries and benefits, lack of social recognition and promotion opportunities, and the complex nature of this demanding occupation.

There are a number of reasons for the low employment growth projected for this occupational group. High day-care costs will continue to encourage parents to seek out cheaper alternatives to sending their children to day care. Alternatives include relying on relatives or hiring a babysitter. In the past, an important factor contributing to the employment growth of this occupation was the rising labour force participation of women with preschool children. This trend has slowed considerably and consequently is no longer a major source of employment growth for this group. Currently, mothers of very young children are almost as likely to work as other women.

Shifting demographics will also have an impact on the employment growth of this occupational group. Currently, population growth in B.C. is driven mainly by immigration and, to a smaller extent, by births. The birth rate is declining, and this means a decline in the number of parents with young children. This will help to flatten the demand for the services of child-care caregivers.

The increasing number of single parent families will continue to be a source of employment growth for this occupational group. In addition, many parents are turning to formal child-care arrangements because they find it too difficult to set up a satisfactory arrangement with a relative, baby sitter or live-in worker, or they may prefer the formal arrangements for personal reasons, such as a more structured learning and social environment.

Another source of employment growth for this group is the increasing level of funding for child care. The year 2000 budget included $14 million to be devoted toward achieving a universal child-care system based on the school system. This is in addition to the 1999 "wage-boosting" contract between government and community social service workers, which will increase the wages of many unionized day-care workers by up to 30% over the following five years. A likely consequence of this increased funding will be to reduce the price of sending children to day care, which will increase the demand for this option by parents. Increased competition and reduced worker turnover among these workers are also probable consequences. Greater opportunities exist for those providing special needs day care, and there could be a shortage of qualified workers in the more rural northern communities.

Advancement is possible as there is mobility among occupations in this group. Early childhood educators with experience can progress to senior positions, such as day-care supervisor. Early childhood educator assistants can become early childhood educators with more training and formal education. Becoming a private day-care operator is also a possibility for those with experience and good skills.

Additional Information

Childcare Resource and Research Unit

http://www.childcarecanada.org

Related Occupations

- elementary school and kindergarten teachers (in 414 secondary and elementary school teachers and counsellors)
- teacher aides (in 6472 elementary and secondary school teacher assistants)

Visiting Homemakers, Housekeepers and Related Occupations

NOC 6471

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	9,220	14,030	17,220

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
3,190	3,390	6,580

Annual Growth 1998-2008	2.1%

Main Industries of Employment

Other Health and Social Services	85%
Personal and Household Services	7%
Provincial and Territorial Administration	2%

Employment by Region

Lower Mainland	49%
Vancouver Island	26%
Northern B.C.	8%
Okanagan/Kootenay	18%

Self-employment	6%

Nature of the Work

Visiting homemakers provide ongoing or short term home support services for individuals and families during periods of incapacitation, convalescence or family disruption. They are employed by government and non-profit agencies and home-care agencies, or they are self-employed.

Housekeepers perform housekeeping and other home management duties in private households, embassies and other residential establishments. *Companions* provide elderly and convalescent clients with companionship and personal care in residential or institutional settings. They are employed by home-care agencies, or they may be self-employed. Foster parents care for children or family members in their homes under the direction of a foster parent agency.

Main Duties

Visiting homemakers care for individuals and families during periods of incapacitation, convalescence or family disruption. They administer bedside and personal care, such as aid in ambulation, bathing and personal hygiene, to clients under the general direction of a home-care agency supervisor or nurse. They plan and prepare meals and special diets. They also demonstrate infant care to new parents.

Housekeepers may, under general direction of an employer, perform routine housekeeping duties such as laundry, washing dishes, making beds and other home management duties. They plan and prepare meals independently or with their employer and may serve meals. They may also care for children.

Companions provide elderly and convalescent clients with companionship and personal care in a client's home under general direction of a home-care agency supervisor or family members. They aid clients with ambulation, bathing and other aspects of personal hygiene.

Foster parents care for foster children, usually on an emergency or temporary basis, as family members under general direction of a foster parent agency. They consult foster parent agency supervisors for advice and when problems arise. They administer therapeutic programs for foster children, as directed by foster agency social workers.

Example Titles

- care aide
- resident care aide
- housekeeping aide
- home-health aide
- home support worker
- visiting homemaker
- housekeeper
- personal aide
- companion
- foster parent

Education and Training

Some secondary school education and some child care or home management experience are the minimum prerequisites for employment in this field. Good references are very important. Some employers will provide training for some of these occupations, but *visiting homemakers* usually require courses in resident care or home support. A driver's licence is usually required, and first aid certification may be necessary. Medical and security checks may be needed. For those who want to remain competitive or advance in this field, completion of high school and a relevant college program is advisable.

Most colleges and university colleges in B.C. offer programs in resident care and/or home support that may be taken part time or full time in 4 to 24 months. Prerequisites usually include grade 10 or equivalent, a minimum age of 19 years, good English, good physical and emotional health, first aid training, experience in a relevant field, either as an employee or a volunteer, and appropriate references. A criminal record check is common. Vancouver Community College (VCC) offers a resident care attendant program for those whose first language is not English. VCC also offers upgrading programs in home support care and long term care, as well as a part-time program for those who are caring for persons with dementia.

Certificates are available for social or human service workers at College of New Caledonia, College of the Rockies, Kwantlen University College, Langara College, North Island College and Okanagan University College. These full-time programs take 10 to 12 months to complete. Applicants must meet a minimum age of 18 to 21 years, depending on the specific program requirement, and have grade 12 or equivalent, good physical and emotional health, experience as a volunteer or employee in a relevant field and references.

A Personal Assistant Working for Persons with Disabilities program is offered by Capilano College. It takes eight months to complete. Applicants must be at least 19 years old and have grade 10 or equivalent, with grade 12 preferred, as well as good physical and mental health and current first aid certification.

College of New Caledonia offers a certificate in developmental disabilities for those providing services to people with mental or physical disabilities. The program is completed through part-time, distance education study.

For those who wish to further their education the University of British Columbia (UBC) and the University of Victoria (UVic) offer a bachelor's and a master's degree through their Schools of Social Work. Those interested should contact the schools for more information on admission requirements.

For a description of college courses in child care and related fields, see the profile Early Childhood Educators and Assistants (6470).

These workers should be neat in appearance and in good physical health since the work may require lifting and other physical tasks. They should have emotional stability and a genuine concern for the well-being of all people. They also need to be understanding and patient and able to maintain a positive attitude. They must be observant, able to follow instructions exactly and dependable but flexible. Writing skills are needed to make reports. Volunteer experience is a definite advantage when looking for work in this area. A willingness to work irregular hours is usually necessary.

Working Conditions

The daily routine of these workers may vary. *Homemakers* may go to the same home every day for months or even years. More commonly, however, they work with a number of different clients, each job lasting a few hours, days or weeks. They often visit four or five clients on the same day.

Surroundings differ from case to case. Some homes are neat and pleasant, while others are untidy or depressing. Some clients are angry, abusive, depressed or otherwise difficult. Others are pleasant and cooperative.

In British Columbia most homemakers work for private or municipal (that is, regional district) organizations. The provincial government's role is confined to setting eligibility criteria. Homemakers generally work on their own with periodic visits by their supervisor. They have detailed instructions that explain when they are to visit clients and what services need to be performed. Many aides work part time, and weekend hours are common.

Most *aides* do not need access to a vehicle, although in some instances an automobile is necessary. Aides may spend a good portion of their working time traveling from one client to another.

Private housekeepers are employed by many types of households with various income levels. They usually work in pleasant and comfortable homes or apartments. Most are day workers who live in their own homes and travel to work. Some live in the home of their employer, generally with their own room and bath.

Live-ins usually work longer hours. However, if they work evenings or weekends, they may get time off. Although living-in may isolate them from family and friends, they often become part of their employer's family and may derive satisfaction from caring for them. Being a housekeeper can also be quite solitary since work is usually done alone. Housekeeping is hard work. Both day workers and live-ins are on their feet most of the day and do a lot of walking, lifting, bending, stooping and reaching. In addition, some employers may be very demanding.

In 1995 the estimated average earnings of visiting homemakers, housekeepers and related workers were $16,000, compared to $27,900 for the all-occupation B.C. average. Approximately 38% of the workers in this group were employed full time for the whole year. These workers received an average of $22,800 in earnings, compared to $39,400 for the all-occupation provincial average. According to a recent survey of college graduates, those who found work in these occupations earned an average of $1,580 per month, based on 29 hours of work per week. This is a very large occupational group, with an estimated 14,030 workers employed in this group in 1998, up 52% from 9,220 in 1990.

Self-employment (6%) is much lower than the all-occupation provincial average of 15%. A much greater proportion of workers in this group work part time (42%), compared to the B.C. all-occupation average (26%). Unemployment for this group is lower than the average for all occupations.

Homemakers, housekeepers and related workers are employed mainly in health and social service agencies and home-care services (85%) and personal and household services (7%). About half of these workers are located in the Lower Mainland (49%). Vancouver Island (26%) and the Okanagan/Kootenay region (18%) have a larger proportion of workers in these occupations than the average for all occupations in B.C., which reflects the fact that several communities in these areas have attracted a significant proportion of seniors.

Women make up 91% of all workers in this group. The average age of homemakers, housekeepers and related workers is 42, which is older than the B.C. all-occupation average of 38 years. Those under 35 represent only 27% of these workers, compared to 40% for the workforce as a whole. There are not many young people entering these occupations.

Employment Prospects

This is a very large occupational group, made up of about 14,030 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment for this group to grow at an annual rate of 2.1%, faster than the average for all occupations. According to this projection, 6,580 positions will become available from 1998 to 2008. A little over half of these openings will come from the need to replace workers who retire. The remainder will come from growth in the number of new jobs. A high rate of worker turnover will create many additional openings. This is a reflection of the relatively low skill requirements, low pay and part-time nature of the work. Therefore, persons who are both interested and suited for this kind of work should have excellent job opportunities, particularly for those with experience or training as homemakers.

Demand for these workers will be particularly strong on Vancouver Island and in the Okanagan, Greater Vancouver and the Fraser Valley. This is because many people move to these regions to retire.

There are two major factors that are responsible for the high projected growth in employment of these occupations. First, the growing and aging of the population in B.C. will increase the demand for health and personal care services. Second, governments are trying to contain health care costs by minimizing the time that patients spend in hospitals. This will increase the reliance on home care for patients of all ages.

There is also a growing belief that treatments can be more effective in familiar surroundings rather than clinical surroundings. This is also increasingly possible because of the development of portable medical equipment for in-home treatment. Elderly patients often do not need the extensive services of an acute care setting but need support services to remain in their own homes.

Advancement is limited for these workers, but there is room for mobility among the occupations in this group. With experience and training, visiting homemakers may move into occupations such as health care aide or long term care aide in nursing homes and long term care institutions. The most experienced aides may assist patients with medical equipment, such as ventilators (devices that facilitate breathing).

A factor fuelling the growth of *housekeepers* is the number of two-income families. Double income households have less time to do household chores and more disposable income. These factors contribute to a growing demand for these workers.

Advancement for *housekeepers* is very limited. There are very few households with large staffs where general house workers can advance to cook, executive housekeeper, or butler. Such jobs require specialized training. Advancement usually consists of higher pay and more desirable working conditions. Workers may move to similar jobs in hotels, hospitals and restaurants, where the pay and benefits are often better.

Related Occupations

- babysitters, nannies and parents' helpers (6474)
- light duty cleaners who are house cleaners (in 666 cleaners)

Elementary and Secondary School Teacher Assistants

NOC 6472

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	6,350	10,190	10,930

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
740	2,310	3,050

Annual Growth 1998-2008	0.7%
Main Industries of Employment	
Education	98%
Other Health and Social Services	2%
Employment by Region	
Lower Mainland	48%
Vancouver Island	19%
Northern B.C.	15%
Okanagan/Kootenay	18%
Self-employment	4%

Nature of the Work

This unit group includes workers who assist elementary and secondary school teachers and counsellors. They are employed in public and private elementary and secondary schools.

Main Duties

Elementary and *secondary school teacher assistants* assist students with lessons under the direct supervision of a classroom teacher. They accompany and supervise students during activities in school gymnasiums, laboratories, libraries, resource centres and on field trips.

They assist special needs students, such as those with mental or physical disabilities, with mobility, communication and personal hygiene. They carry out behaviour modification, personal development and other therapeutic programs under supervision of professionals, such as special education instructors, psychologists or speech-language pathologists.

They operate or assist teachers in the operation of projectors, tape recorders and other audio-visual or electronic equipment. They monitor students during recess and noon hour as well as assist in the school library or office. They also perform other duties assigned by a school principal.

Example Titles

- special education assistant
- lunch room supervisor

- educational resources assistant
- teacher's aide
- teacher's assistant
- program assistant, education
- staff assistant, education
- secondary school teacher's assistant

©Stone/Vancouver

Education and Training

Completion of secondary school is usually required, and college courses in child care or related fields may be required for people in this field. Completion of teacher aide programs is a definite asset. *Teaching assistants* who aid students with special needs may require specialized training and experience. First aid training is an asset, and obtaining relevant experience as a volunteer is often beneficial.

For a description of courses in child care and related fields see the profile Early Childhood Educators and Assistants (6470).

Northern Lights College has a Teacher Assistant Training Certificate that takes 10 months for full-time students to complete. A one-year Special Education Assistant certificate program is offered at College of New Caledonia and Langara College. College of the Rockies offers a 10-month Teacher Assistant Certificate program where students will use onsite and distance study methods. Although it is a full-time program, some part-time positions are also available so students may complete the program over a two-year period. Okanagan University College offers an Education Assistant Certificate through its Continuing Education department.

Prerequisites for these programs most often include grade 12, a minimum age of 19 years, college-level writing and academic skills, proven medical fitness and recent relevant experience as an employee or volunteer in a licensed setting. Criminal record checks are usually conducted.

For those who wish to advance in this area to become an elementary/secondary school teacher, see the profile Secondary and Elementary School Teachers and Counsellors (414).

These workers should be emotionally stable and should relate well to children. A good sense of humour is important, as well as patience and understanding. Good interpersonal and communication skills are essential.

Working Conditions

Most *elementary* and *secondary school teacher assistants* work the traditional school year, usually in a classroom setting. But they may work outdoors supervising recess when weather allows and spend much of their time standing, walking, or kneeling. Seeing students develop and learn can be very rewarding. However, working closely with students can be both physically and emotionally tiring.

Earnings are well below average. In 1995 the average earnings of all elementary and secondary school teacher assistants was $14,200, compared to the B.C. average for all occupations of $27,900. Only 8% of the workers were employed full time for the whole year. These full-time, full-year workers received an average of $25,400 in earnings, much less than the B.C. average for all occupations of $39,400. According to a recent survey of college graduates who found work in this occupation, the average earnings were $1,700 per month, based on 25 hours of work per week.

This is a very large occupational group, with an estimated 10,190 workers employed in B.C. in 1998, up 60% from 6,350 in 1990. Self-employment is nearly non-existent for this group.

These workers have a lower unemployment rate than the average for all occupations. However, only 34% work full time, and 66% work part time. In addition, 59% work part time for part of the year. By comparison, 74% of the entire B.C. workforce are employed full time, 26% work part time, and only 18% work part time for part of the year.

Most workers in this group are employed in education (98%). The Lower Mainland has a smaller proportion of elementary and secondary school teacher assistants and Northern B.C. has a higher share, compared to the average for all-occupations. About 48% of the workers are located in the Lower Mainland, 19% are on Vancouver Island, 18% are in the Okanagan/Kootenay region, and 15% are in Northern B.C.

Women predominate. They represent 90% of all workers in this group. Workers aged 35 to 44 are overrepresented in this occupation, as they represent 42% of all workers, while they make up only 28% of the total B.C. workforce. The average age is 40.

Employment Prospects

This is a very large occupational group, made up of about 10,190 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment for this group to grow at an annual rate of 0.7%, slower than the average for all occupations. According to this projection, 3,050 positions will become available from 1998 to 2008. About three-quarters of these openings are projected to come from the need to replace workers who retire. The remainder are projected to come from growth in the number of new jobs.

One source of uncertainty with this forecast is that these workers are in government-funded positions. Any future changes in legislation that affect the level of support for child care and/or the educational requirements of elementary and secondary school students will have an impact on the number of teacher assistants employed in B.C.

Almost all of these workers are employed in the education industry (98% in 1998). Government restraint and an increasing student-to-teacher ratio will continue to cause the employment of teacher assistants to grow more slowly than employment in the overall education industry, which is projected to grow at an average rate. Government spending cuts will be aimed more directly at non-teacher occupations, such as teacher assistants, in order to reduce expenditure on education while minimizing any potential compromise to the student-to-teacher ratio.

Many *teacher assistants* work in special education, where children with special needs require much personal attention. Most openings for these workers will be in this area.

Mobility to other occupations related to child and adolescent care is possible with further education or training and experience.

Related Occupations

- elementary school and kindergarten teachers (in 414 secondary and elementary school teachers and counsellors)
- early childhood educators (in 6470 early childhood educators and assistants)
- early childhood educator assistants (in 6470 early childhood educators and assistants)

> ***These workers should be emotionally stable and should relate well to children. A good sense of humour is important, as well as patience and understanding. Good interpersonal and communication skills are essential.***

Babysitters, Nannies and Parents' Helpers

NOC 6474

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	12,480	20,370	22,700

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
2,330	4,660	6,990

Annual Growth 1998-2008 1.1%

Main Industries of Employment

Other Health and Social Services	52%
Personal and Household Services	46%

Employment by Region

Lower Mainland	56%
Vancouver Island	17%
Northern B.C.	10%
Okanagan/Kootenay	17%

Self-employment 26%

Nature of the Work

Babysitters care for children on an ongoing or short-term basis. They are usually self-employed or may be employed by babysitting agencies. *Nannies* care for children in the employer's residence and provide for their health as well as their physical and social development. *Parents' helpers* assist one or both parents with child care and household duties. Nannies and parents' helpers are employed by private households, where they may also reside.

Main Duties

Babysitters supervise and care for children in the absence of a regular caregiver. They bathe, diaper and feed infants and children, and they organize games, activities and outings to provide amusement and exercise. They may perform housekeeping duties and prepare meals for children according to their employer's instructions.

Nannies supervise and care for children in their employer's residence. They bathe, diaper and feed infants and children as well as oversee the children's activities, such as meals and rest periods, as instructed by their employer. They instruct children in personal hygiene and social development and organize games, activities and outings to provide amusement and exercise. They also prepare meals and launder clothing for children and may perform these and other housekeeping duties for the household.

Parents' helpers assist parents in child supervision and household management. They bathe, diaper and feed infants and children under the direction of one or both parents. They assist with, or may be responsible for, meal preparation, laundry, washing dishes, running errands and other routine housekeeping duties.

Example Titles

- babysitter
- parents' helper
- nanny
- live-in caregiver

Education and Training

To work in this field, completion of secondary school is usually required. Child care or home management experience may be required, and persons employed as *nannies* or live-in caregivers may need to complete a training program in child care or a related field. It may be necessary to undergo medical and security checks and to obtain first aid certification. Employers often require demonstrated ability to do the work. Volunteer work in a relevant field can be a definite asset.

College of the Rockies offers a part-time Family Day Care program, which takes about 126 hours to complete. Students study at home in a distance format. Applicants must be Canadian citizens, at least 19 years of age and able to read and write at an appropriate level and must submit medical records and letters of reference. University College of the Fraser Valley has a part-time certificate program in family child care through its Continuing Education department. Applicants must be able to read and write at grade 12 level and in good physical and mental health and have a keen commitment to working with young children. The Family Day Care Certificate at North Island College is a ten-month program. Interested participants should note that the program is offered in two or three communities each year, at the request of the community.

For a review of credit programs in child care and related areas, see the profile Early Childhood Educators and Assistants (6470).

These workers should be neat in appearance, with high energy in order to work with active children. They should be emotionally stable. A good sense of humour is important, as well as patience and understanding. Good interpersonal and communication skills are necessary.

Working Conditions

These workers are employed by many types of households of various income levels. Most are day workers who live in their own homes and travel to work. Some live in the home of their employer, generally with their own room and bath.

Live-ins usually work longer hours. However, if they work evenings or weekends, they may get time off. Living-in may isolate them from family and friends. On the other hand, they often become part of their employer's family and may derive satisfaction from caring for them.

In 1995 the average earnings of babysitters, nannies and parents' helpers was only $6,700, which is about one-quarter of the B.C. average of $27,900 for all occupations. Only about one out of five workers in this group were employed full time for the whole year. These full-time, full-year workers received an average of $13,600 in earnings, compared to $39,400 for the B.C. average for all occupations. According to a recent survey of college graduates, those who found work in these occupations earned an average of $1,040 per month, based on 31 hours worked per week.

This is a very large occupational group, with an estimated 20,370 workers employed in B.C. in 1998, up 63% from 12,480 in 1990. Self-employment for this group is much higher (26%) than the provincial average for all occupations (15%). Only 46% of these workers are employed full time, and 54% work part time. In addition, 46% work part time for part of the year. By comparison, 74% of the B.C. workforce are employed full time, 26% work part time, and only 18% work part time for part of the year.

Unemployment for babysitters, nannies and parents' helpers is about the same as the average for all occupations.

Workers in this group are employed mainly in personal and household services (46%) and other health and social services (52%). The geographic distribution is very similar to the average for all occupations. About 56% of the workers are located in the Lower Mainland, 17% on Vancouver Island, 17% in the Okanagan/Kootenay region and 10% in Northern B.C.

Women are predominant in this occupational group where they represent 94% of all the workers. These occupations employ a high proportion of young people. Those aged 15 to 24 represent 34% of the workers in this group compared to only 15% of the workforce as a whole. In addition, 61% of these workers are under 35. The average age is 33.

Employment Prospects

This is a very large occupational group, made up of about 20,370 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment for this group to grow at an annual rate of 1.1%, slower than the average for all occupations. According to this projection, 6,990 positions will become available from 1998 to 2008. About two-thirds of these openings will come from the need to replace workers who retire, and the remainder will come from growth in the number of new jobs. A high rate of worker turnover will create many additional openings. This is a reflection of the part-time nature of the work, the relatively low skill requirements and the low pay.

There are a number of reasons for the low employment growth projected for this group. In the past an important factor contributing to the employment growth of these occupations was the rising labour force participation of women with preschool children. This trend has slowed considerably and consequently is no longer a major factor in the employment growth of this occupation. Currently, mothers of very young children are almost as likely to work as other women. In addition, many parents are sending their children to day-care centres instead of hiring a *babysitter* or a *nanny*. This is because parents often find it too difficult to set up a satisfactory arrangement with an individual to look after their kids. Many parents also prefer the day-care option because of the associated structured learning and social environment.

Another reason for the low employment growth in this field is the increasing level of funding for child care in public settings. The B.C. provincial government's year 2000 budget designated $14 million toward achieving a universal child-care system based on the school system. A likely consequence of this increased funding will be a reduction in the cost to parents of sending their kids to day care, which will increase the relative attractiveness of this option to parents.

Shifting demographics will also have an impact on the employment growth of this group. Currently, population growth in B.C. is driven mainly by immigration and, to a smaller extent, by births. A declining birth rate means a declining number of parents with young children. This in turn will reduce the demand for child-care services. However, the increasing number of single parent families will be a source of some employment growth.

Advancement is limited, but there is mobility among occupations in this group and in the broader child-care and home support workers group. With experience and training, *babysitters*, *nannies* and *parents' helpers* may move into day-care centres and nursery schools and work as early childhood educator assistants. Becoming a private day-care operator is also a possibility.

Career progression into elementary and secondary school teacher assistant occupations is also possible with more formal education.

Related Occupations

- early childhood educators and assistants (6470)
- day care workers (in 6470 early childhood educators and assistants)
- visiting homemakers, housekeepers and related occupations (6471)
- companions and foster parents (in 6471 visiting homemakers, housekeepers and related occupations)

> ***These workers are employed by many types of households of various income levels. Most are day workers who live in their own homes and travel to work. Some live in the home of their employer, generally with their own room and bath.***

Other Occupations in Personal Service

NOC 648

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	3,490	4,440	5,800

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
1,360	260	1,620

Annual Growth 1998-2008 2.7%

Main Industries of Employment

Personal and Household Services	47%
Agriculture	27%
Retail Trade	12%

Employment by Region

Lower Mainland	65%
Vancouver Island	14%
Northern B.C.	6%
Okanagan/Kootenay	16%

Self-employment 36%

Nature of the Work

This occupational group encompasses various personal services for the physical and mental well-being of both people and pets.

Image, social and *other personal consultants* advise clients on their personal appearance, speaking style, manners or other behaviours in order to improve personal or business images. They are employed by beauty salons, fashion boutiques, modelling schools and image consulting companies or may be self-employed.

Estheticians, electrologists and *related occupations* provide facial and body treatments designed to enhance an individual's physical appearance. They are employed in beauty salons, electrolysis studios, scalp treatment clinics and other similar establishments, or they may be self-employed.

Pet groomers and *animal care workers* feed, handle, train and groom animals and assist veterinarians, animal health technologists and animal breeders. They are employed by animal hospitals and clinics, animal shelters, breeding and boarding kennels, zoos, pet grooming service companies and laboratories.

This occupational group also includes occupations not classified elsewhere that provide psychic consulting, fortune telling, astrological and similar services. Workers in these occupations are usually self-employed.

Main Duties

Image consultants advise clients on hair colour, hairstyle, make-up, clothing and accessories and may advise on posture, general appearance and manner. *Make-up consultants* advise clients on type, colour and application of make-up. Colour consultants advise clients on choice of colours for clothing that will complement their appearance. *Wedding consultants* advise clients on the selection of wedding gowns, floral arrangements, banquet facilities, wedding invitations and other items related to weddings. *Weight loss consultants* administer commercial weight loss programs, advise clients on diet and exercise and provide related support services.

Cosmeticians apply make-up to clients and advise on its use. *Manicurists* and *pedicurists* clean, shape and polish fingernails and toenails and provide related treatments. *Scalp treatment specialists* apply medicated lotions to treat scalp conditions and hair loss. *Tattoo artists* apply permanent designs to customers' skin using electric needles and chemical dyes.

Pet groomers and *animal care workers* prepare food and feed animals at scheduled intervals, and they clean and disinfect cages, pens and surrounding areas. They shampoo, clip and groom animals, assist veterinarians and animal health technologists to inoculate and treat animals, assist animal breeders, and assist scientists and researchers in conducting laboratory tests with animals. They also monitor and document animal behaviour, and they train dogs to obey commands and perform specific duties in response to signals.

Astrologers chart and interpret stellar and planetary positions on a horoscope to predict future events and trends for a client or the general public. *Psychic consultants* provide personal advice to clients based on various schools of thought.

Example Titles

image, social and other personal consultants (6481):
- public speaking consultant
- fashion and wardrobe consultant
- professional image consultant
- etiquette consultant
- weight loss consultant
- wedding consultant
- colour consultant, fashion
- image consultant
- wardrobe consultant

estheticians, electrologists and related occupations (6482):
- beauty treatment operator
- electrologist technician
- cosmetician
- electrologist
- esthetician
- manicurist
- scalp treatment specialist
- tattoo artist
- pedicurist

pet groomers and animal care workers (6483):
- dog groomer
- veterinary attendant
- dog trainer
- pet groomer
- kennel attendant
- pound attendant
- laboratory animal attendant
- zoo attendant
- animal care worker

other personal service occupations (6484):
- psychic consultant
- astrologer
- fortune teller
- psychic reader

Education and Training

Completion of secondary school is the usual prerequisite to train for employment in this field, although some programs require only grade 10. Training to provide services to other people typically consists of taking specialized courses. Students can become *fashion consultants, cosmeticians, estheticians, electrologists, manicurists* and *pedicurists*. For *pet groomers* and *animal care workers*, courses in animal grooming or handling may be required. On-the-job training may be provided by some employers. Self-directed learning is usually necessary for those who provide services such as astrological counselling and fortune telling.

Following appropriate training, estheticians must obtain a licence issued by the Cosmetologists' Association of B.C. This licence can be used as a prerequisite for further specialized training in areas such as body massage and electrolysis. Although a licence is not mandatory to become an electrologist in B.C., it is required to become a member of the Association of Professional Electrologists of British Columbia. Certification for electrologists is also available through the Federation of Canadian Electrologists.

Vancouver Community College offers a seven-month Esthetics (Skin Care) Program. Applicants must have grade 10 or equivalent, and they must pass a medical examination. Licensed graduates work as estheticians, technicians, cosmetic company representatives and make-up artists. Graduates of the Esthetics (Skin Care) Program will be prepared to write the exam for the Cosmetologists' Association of B.C. Special Beauty Culture Licence.

Kwantlen University College offers a Fashion Marketing Certificate program of one year's length, after which graduates can work at wholesale and retail levels of marketing. Completion of grade 12 or equivalent is necessary in order to apply. The certificate may be taken on its own or in conjunction with the Fashion Design and Technology Diploma. The program is two years in length. It is anticipated that the Fashion Design and Technology Diploma will change substantially. The diploma is expected to include most of the courses in Kwantlen's recently introduced Bachelor of Applied Design in Fashion Design and Technology Degree. Contact an academic advisor for up-to-date details.

The University College of the Fraser Valley offers a two-year Fashion Design Diploma, which prepares students for a variety of employment fields, including retail sales and fashion coordination. Applicants must be at least 19 years of age, have completed grade 12 and go through an interview process to assess creative, technical, communication and mathematical skills. The program is normally on a full-time basis, but part-time studies are available.

The University College of the Cariboo (UCC) is the only public institution in B.C. that offers a program for those who wish to work as animal care workers. The Animal Health Technology Diploma program takes two years to complete, and graduates obtain work in veterinary offices, animal shelters and zoological parks. The program is accredited by the Canadian Veterinary Medical Association. Applicants must have grade 12, pass a medical examination and show evidence of orientation to a veterinary practice. Computer experience is recommended. Seats are limited for this program, and competition is high. UCC also offers an Animal Welfare Certificate Program to give animal care workers and members of the public a means of upgrading their knowledge via distance education. Interested applicants should contact the school for more information.

People providing services to other people in this area of employment must have normal colour vision and good depth perception, and they should communicate well with people. Those working with animals should not mind getting dirty and should be prepared to cope with unhappy or injured animals. They must be able to work as part of a team and should be reasonably fit and allergy-free.

Generally, good stamina and manual dexterity are required in this area as is a willingness to work irregular hours when necessary. These workers should enjoy working with a wide variety of people and have good communication skills. Basic knowledge of computers, analytical skills and flexibility are assets. Those considering ownership of their own operations should be prepared to learn business and bookkeeping techniques, as well as entrepreneurial and managerial skills.

Working Conditions

Image, social and *other personal consultants* and people who work as *estheticians, electrologists* and in *related occupations* usually work in clean, pleasant surroundings with good ventilation. Good health and stamina are important because these workers must stand a great deal. Prolonged exposure to some hair and nail chemicals may be hazardous and cause irritation, so special care must be taken when working with these chemicals. People working full time in these occupations may work more than 40 hours a week. This often includes evenings and weekends, when beauty salons are busiest. Although weekends and lunch periods are generally very busy, people working in these occupations may have some time off during slack periods.

Pet groomers and *animal care workers* who love animals will get satisfaction from working with and helping animals. However, some of the work may be physically demanding and unpleasant. Pet groomers and animal care workers have to clean animal cages and lift heavy supplies like bales of hay. In addition, the work setting is often noisy. Some duties, such as providing euthanasia for a hopelessly injured or aged animal, may be emotionally stressful.

Pet groomers and animal care workers can be exposed to bites, kicks and disease from the animals they attend. Animal care workers may work outdoors in all kinds of weather. Further, the hours are usually irregular. Animals have to be fed every day, so animal care workers rotate weekend shifts. In some animal hospitals and animal shelters, at least one attendant will be on duty at all times, which means night shifts for some attendants. Most full-time caretakers work about 40 hours a week, although some may work 50 hours a week or more.

Although the 1996 Census lists 240 persons who are employed in psychic consulting, fortune telling, astrological and similar personal service occupations in B.C., there are probably a large number who have not reported themselves as such due to the unstructured and "fringe" nature of these occupations. In particular, there are probably many people who earn only part of their income from this source as casual workers and do not report it. Workers in these occupations often give consultations in their homes or at fairs.

In 1995 the average annual earnings for all workers in this occupational group were $13,800, with the 33% who worked full time for the whole year receiving $20,400 in earnings. Average annual earnings were higher for those employed as image, social and other personal consultants, at $15,800 ($26,100 for full-time, full-year positions) and lower for pet groomers and animal care workers, at $12,700 ($20,300 for full-time, full-year positions). The all-occupation annual earnings averages were $27,900 and $39,400 for full-time, full-year positions. According to a recent survey of college graduates who found work as estheticians, electrologists and in related occupations, the average earnings were $1,560 per month, based on 30 hours of work per week. (This level of earnings equates to $18,700 per year.) Those who found work as pet groomers and animal care workers reported an average earnings of $1,270 per month, based on 29 hours of work per week. (This level of earnings equates to $15,300 per year.)

The number of employed workers rose 27%, from 3,490 in 1990 to 4,440 in 1998. About 50% of the workers in this group are estheticians, electrologists or in related occupations, 36% are pet groomers or animal care workers, 10% are image, social and other personal consultants, and the rest (9%) are in other personal service occupations, such as psychic consulting or astrology.

Compared to the provincial all-occupation average of 15%, self-employment for this occupational group stands much higher at 36%. For those in personal service occupations, such as psychic consultants and astrologers, 44% report being self-employed. Part-time work is also very common. About 61% of the entire group work full time, and 39% work part time. However, part-time work is even more common among psychic consultants and astrologers (46%) and among image, social and other personal consultants (53%). The all-occupation rate for part-time employment in B.C. is 26%.

Unemployment for the group as a whole is lower than the average for all occupations. However, the unemployment rate is higher than the average for other personal service occupations. Overall, the level of part-year employment for this group (54%) is higher than the average for all occupations in B.C. (45%).

The industries in which the largest concentrations of personal service workers are employed are personal and household services (47%), agriculture (27%), retail trade (12%) and amusement and recreational services (4%).

The regional distribution of workers in this group has a somewhat higher emphasis on the Lower Mainland than the average for the workforce as a whole. There are 65% of the workers located in the Lower Mainland, 16% in the Okanagan/Kootenay region, 14% on Vancouver Island and 6% in Northern B.C.

Women make up the vast majority (85%) of the workers in this group. They tend to be younger than the average. Overall, 54% of all workers in this occupational group are under 35, compared to only 40% for all occupations. In particular, 57% of pet groomers and animal care workers are under 35. The average age for all workers in this occupational group is 35, three years younger than the all-occupational average.

Employment Prospects

This is a medium-sized occupational group, made up of about 4,440 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment for this group to grow at an annual rate of 2.7%, much faster than the average for all occupations. According to this projection, 1,620 positions will become available from 1998 to 2008. Most of these openings (84%) will come from growth in the number of new positions, and the remainder will come from the need to replace workers who retire. Many additional openings will result from worker turnover.

Employment growth projections for each occupation within this occupational group differ, but all are projected to grow faster than the average for all occupations. These differences and, much more importantly, the differences in the sizes of these occupations, determine how many of the total projected openings are accounted for by each occupation. Half of all workers in this occupational group were either *estheticians* or *electrologists* or in a related occupation in 1998. Together, these occupations account for most (56%) of the projected openings, reflecting the continuing shift in consumer preference to more personalized services. *Pet groomers* and *animal care workers* account for 27% of employment openings, and *image, social* and *other personal consultants* account for 11%. *Other personal service occupations*, such as psychic consulting, fortune telling, astrological and similar services, account for the remaining 6% of the projected openings.

According to industry sources, the main sources of employment growth for these workers are the shifting preferences of consumers and a growing population. There is an increasing concern among consumers about their appearance and mannerisms. For this reason, there are a growing number of establishments that provide specialty services. Indeed, some beauty salons provide only the service of finger nail enhancements. This increase in specialty services stands in contrast to the relatively slow growth in the number of full-service unisex salons. In addition, with a growing number of double income families, people have less time to provide these services for themselves.

Previous experience will be an asset in seeking work, and there will continue to be opportunities for those with less formal education, given the entry-level nature of jobs in this occupational group.

There is little or no mobility among the various occupations in this unit group without additional specialized training. Progression to animal health technology occupations is possible with additional training for pet groomers and animal care workers.

Related Occupations

- image, social and other personal consultants (6481)
- hairstylists and barbers (6271)
- estheticians, electrologists and related occupations (6482)
- hairstylists and barbers (6271)
- pet groomers and animal care workers (6483)
- animal health technologists (in 321 medical technologists and technicians (except dental health))
- animal nutritionists (in 2121 biologists)
- horse trainers (in 825 contractors, operators and supervisors in agriculture, horticulture and aquaculture)
- marine mammal trainers (in 2221 biological technologists and technicians)
- sheep shearers (in 843 agriculture and horticulture workers)

Basic knowledge of computers, analytical skills and flexibility are assets. Those considering ownership of their own operations should be prepared to learn business and bookkeeping techniques, as well as entrepreneurial and managerial skills.

Cashiers

NOC 6611

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	27,770	33,290	42,600

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
9,310	2,920	12,230

Annual Growth 1998-2008	2.5%
Main Industries of Employment	
Retail Trade	75%
Accommodation and Food Services	12%
Amusement and Recreation Services	3%
Employment by Region	
Lower Mainland	55%
Vancouver Island	18%
Northern B.C.	10%
Okanagan/Kootenay	17%
Self-employment	2%

Nature of the Work

Cashiers record and receive payment from customers in stores, restaurants, theatres, business offices and other retail and wholesale establishments for the purchase of goods, services and admission.

Main Duties

Cashiers establish or identify the price of goods, services or admission and tabulate the bill using a calculator, cash register or optical price scanner. They receive payment by cash, cheque, credit card or automatic debit, they wrap or place merchandise in bags, they provide information to customers, and they calculate total payments received at the end of their work shift and reconcile this with total sales.

Example Titles

- race track cashier
- theatre cashier
- self-serve gas bar cashier
- grocery store cashier
- cafeteria cashier
- office cashier
- box office cashier

Education and Training

Most employers prefer to hire *cashiers* who have a high school diploma or some business experience and can work with numbers accurately and quickly. Cashiers may work with large sums of money, must be bondable (acceptable to a bonding company as a responsible person) and must have a police security check.

Expert cashiers have a good memory for faces, can deal pleasantly with all kinds of people and are able to keep cool under pressure. Frequently cashiers are called upon to handle customer complaints. Grocery store cashiers must be able to recognize different types of produce and remember the assigned codes that go with them.

Since the work involves dealing with the public, employers want employees who are neat, friendly and able to talk easily with their customers. Tact and patience are important skills. Employers also need staff who can do the same job accurately over and over again. Cashiers often stand for many hours continuously so physical stamina is a requirement for this work, as is an ability to follow written and spoken instructions and work under pressure.

Cashiers are usually trained on-the-job, but completion of a pre-employment program is an asset. An aptitude for mathematics, basic analytical skills, an ability to read and write in order to complete simple reports and computer literacy are necessary skills in this line of work. Knowledge of computer cash registers is an asset. Some employers provide short training sessions before putting inexperienced cashiers to work on the selling floor. It generally takes two to three weeks to learn all the duties of a cashier.

Working Conditions

More than one-half of all *cashiers* work part time. Hours of work often vary depending on the needs of the employer. Generally, cashiers are expected to work weekends, evenings, and holidays to accommodate customers' needs.

Most cashiers work indoors, usually standing in booths or behind counters. In addition, they are often unable to leave their work station without supervisory approval since they are responsible for large sums of money. The work of cashiers can be very repetitious, but improvements in machine design are being made to combat problems caused by repetitive motions.

Dealing with angry customers can be very taxing, but for those who like daily interaction with people, the work can be rewarding.

In 1995 the average annual earnings for all workers in this occupation were $12,200, with the 23% who worked full time for the whole year receiving $21,900 in earnings. The respective all-occupation averages were $27,900 and $39,400. The number of employed workers rose 20%, from 27,770 in 1990 to 33,290 in 1998. According to a recent survey of college graduates who found work as cashiers, the average earnings were $1,040 per month, based on 25 hours worked per week.

At less than 3%, there is very little self-employment among cashiers. This is an occupation that provides a lot of part-time employment opportunities. About 57% of these workers are employed on a part-time basis, which compares to 26% for the workforce as a whole, while only 44% work full time, compared to 74% for the all-occupation average. Industry sources believe that even more will work part time in future. The unemployment rate for cashiers is about the same as the average for all occupations.

Most cashiers work in retail trade (75%). Other industries in which they are employed include accommodation and food services (12%), amusement and recreational services (3%) and wholesale trade (3%). The regional distribution of workers in this group is similar to the all-occupation average, with 55% located in the Lower Mainland, 18% on Vancouver Island, 17% in the Okanagan/Kootenay region and 10% in Northern B.C.

Women make up the vast majority (85%) of cashiers in B.C. This is an entry-level position, and it often provides a source of income for high school and post secondary students during and between semesters. The youthfulness of this group is indicated by the fact that nearly half (45%) of those working as cashiers are aged 15 to 24, compared to only 15% for the workforce as a whole. The average age is 30.

Employment Prospects

This is a very large occupational group, made up of about 33,290 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment for this group to grow at an annual rate of 2.5%, much faster than the average for all occupations. According to this projection, 12,230 positions will become available from 1998 to 2008. About three-quarters of these openings will come from growth in the number of new jobs. The remainder will come from the need to replace workers who retire. A high rate of worker turnover will create many additional openings. High turnover reflects the relatively low skill requirements, low pay and often part-time nature of this work.

A risk to the COPS forecast is the increasing use of scanning and other technology that increases the productivity of cashiers. With higher cashier productivity in larger retail establishments, fewer cashiers are required.

Persons who are interested and suited for this work should have good job opportunities, particularly those with experience or training. As this is an entry-level job, many of the people seeking work in this occupation have recently left school or are new immigrants.

Cashiers may progress to supervisory positions, such as head cashier, with experience.

Related Occupations

- tellers, financial services (in 143 finance and insurance clerks)
- head cashiers (in 621 sales and service supervisors)
- retail salespersons and sales clerks (6421)
- service station attendants (in 662 other sales and related occupations)

Other Sales and Related Occupations

NOC 662

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	26,600	32,590	39,140

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
6,550	1,170	7,720

Annual Growth 1998-2008	1.8%
Main Industries of Employment	
Retail Trade	83%
Other Business Services	4%
Wholesale Trade	2%
Employment by Region	
Lower Mainland	54%
Vancouver Island	19%
Northern B.C.	10%
Okanagan/Kootenay	17%
Self-employment	15%

Nature of the Work

This occupational group encompasses a variety of sales occupations.

Service station attendants employed in automotive service stations sell fuel and other automotive products and perform such services as fueling, cleaning, lubricating and performing minor repairs to motor vehicles. Those employed in marinas sell fuel, rent boats and related equipment, and maintain marina facilities.

Grocery clerks and *shelf stockers* pack customers' purchases, price items, stock shelves with merchandise and fill mail orders. They are employed in retail establishments, such as grocery, hardware and department stores, and in mail-order warehouses.

This occupational group also includes workers who sell goods or services during home demonstrations or by telephone soliciting, retail exhibitions or street vending. They are employed by a wide range of retail and wholesale establishments.

Main Duties

Automotive service station attendants refuel vehicles and receive payment from customers. They also perform minor service and maintenance tasks, such as washing the windshield, checking fluid levels and air pressure, lubricating the vehicle, changing the motor oil and antifreeze, and replacing parts, such as light bulbs, oil filters, windshield-wiper blades and fan belts.

In addition to receiving payment from customers, attendants at marina service stations refuel boats, pump a boat's marine septic system, and rent boats, life jackets and other equipment. They also record rental data, maintain the dock area and marina facilities, and assist in seasonal moving of ramps and docks.

Grocery clerks and *shelf stockers* bag, box or parcel purchases for customers or for shipment or delivery to customers. They carry customers' purchases to the parking lot and pack the purchases into customers' vehicles. They price items according to a price list, they stock shelves and display areas, and they keep stock clean and in order. They also fill mail orders from warehouse stock, obtain articles for customers from shelves or the stockroom, direct customers to the location of articles sought, sweep aisles and perform other general cleaning duties.

Direct distributors and *door-to-door salespersons* sell merchandise by soliciting sales in private homes. Street vendors set up and display merchandise on sidewalks or at public events to sell to the public. Telephone solicitors and telemarketers contact businesses or private individuals by telephone to solicit sales for goods or services. Demonstrators show, describe and sell goods or services at wholesale, retail and industrial establishments and at exhibitions, trade shows and private homes.

©Stone/Vancouver

Example Titles

service station attendants (6621):
- gas station attendant (except self-serve)
- marina attendant

grocery clerks and shelf stockers (6622):
- price clerk - retail
- grocery packer
- bag clerk
- produce clerk
- supermarket clerk
- warehouse stock picker
- order filler

other elemental sales occupations (6623):
- telemarketer
- direct distributor - retail
- door-to-door salesperson
- street vendor
- demonstrator - retail
- telephone solicitor
- canvasser - retail
- home demonstrator - retail

Education and Training

Service station attendants usually require some secondary school education, and propane and natural gas pump attendants may require an operator's licence. High school courses in English, mathematics, business, computer skills and automechanics may be useful.

Attendants should enjoy working with people, and they need to be friendly, polite and helpful to others. Basic reading and writing skills are required to read the numbers on the gas pumps and to fill in credit card slips. In addition, attendants may be required to fill in customer complaint forms and to read maps. Some customers pay for gasoline in cash, so attendants must be able to provide them with the correct change. At the end of the shift, attendants may also be required to balance the cash register.

Attendants are trained on-the-job by skilled attendants or by the station manager. It takes one or two weeks to learn the duties. Some large companies have training programs for service station attendants that involve learning how to deal with customers and how to sell various services and products. A driver's licence is sometimes needed for this work because attendants may need to move cars.

Grocery clerks and *shelf stockers* may require some secondary school education and computer literacy. Applicants with courses in business and administration at the college level are preferred. On-the-job training is provided as to how to monitor and replenish inventory.

Warehouses use computers for filing and inventory control so stock clerks should be proficient in their use. Employers look for people with good math skills, an ability to perform fast and accurate calculations and a capacity for detailed work. Good communications skills, basic analytical skills and the ability to follow instructions are also important.

For those who would like to become inventory control professionals, British Columbia Institute of Technology (BCIT) offers a two-year Operations Management Diploma as well as a nine-month Applied Operations Management Certificate that stress business process improvements, communication skills, creativity, innovation and problem solving. Okanagan University College (OUC) also offers a Business Studies Certificate Program in which operations management is an area of specialization. For more details see the profile about Recording, Scheduling and Distributing Occupations (147).

Other sales related occupations, such as canvassers, demonstrators, door-to-door salespeople, street vendors and telemarketers, generally require some secondary school education. Basic reading, writing and arithmetic skills are required to read instructions and labels and to fill out sales slips. Demonstrators need to have a professional appearance and be able to present information in an informative and entertaining manner in a variety of settings. Sales people need to be able to communicate easily with a wide variety of people, and they must promote and sell a particular product or service. Generally, people in these occupations need to be able to maintain enthusiasm for their work and their product, even when sales are down and income is inconsistent.

Self-employed street vendors and door-to-door salespersons may require a municipal business licence. They may also need to invest in equipment to carry out their work. For example, a street vendor may have to buy a vending cart with stove and freezer units.

Working Conditions

Working conditions for this occupational group vary depending on specific occupations. Many of these workers spend much of their time working outside. Over half of them are on part-time schedules. Hours of work often vary depending on the needs of the employer. Many workers are expected to work weekends, evenings and holidays to accommodate customers' needs.

Service station attendants work indoors and outdoors in all weather conditions. They are sometimes exposed to harmful chemicals, fumes and odours and must observe safety procedures constantly. Their shifts are often 8 hours, but may sometimes be longer or require employees to work at night.

Grocery clerks and *shelf stockers* usually work in clean, well-ventilated, and well-lit buildings. Grocery packers often need to go outside in all weather conditions to carry customers' purchases to the parking lot. Grocery clerks and shelf stockers have to do lifting. They must frequently stoop, bend and reach, and spend most of their time on their feet. They may have to work at night to stock shelves in grocery stores.

Workers employed in *other elemental sales occupations* sell goods or services, for example, direct distributors and door-to-door salespersons, and will often be required to walk long distances, carry product samples or stand for long periods. They can expect to encounter competition and might have to work weekends and evenings. They also work as telemarketers from their homes or offices, in which case they are often paid on commission.

In 1995 the annual earnings in this occupational group were lower than the workforce average. The average annual earnings for all workers in this group were $13,300, with those who worked full time for the whole year (26%) receiving $26,000. The respective all-occupation averages in B.C. were $27,900 and $39,400. At the low end, the average earnings of service station attendants were $8,500 ($16,600 for full-time, full-year work). At the higher end, the average earnings for grocery clerks and shelf stockers were $15,700 ($28,400 for full-time, full-year work). According to a recent survey of college graduates who found work in this occupational group, at the low end, service station attendants reported earning an average of $1,090 per month, based on 33 hours worked per week. At the high end, those who found work in other elemental sales occupations reported earning an average of $1,580 per month, based on 27 hours worked per week.

The number of employed workers rose 23%, from 26,600 in 1990 to 32,590 in 1998. Half of the growth involved other elemental sales occupations (such as telemarketing). Grocery clerks and shelf stockers represent 46% of the workers, 19% are service station attendants, and the remaining 35% are in other elemental sales occupations.

The level of self-employment varies substantially across these occupations. About 39% of workers in other elemental sales occupations are self-employed, but self-employment stands at only 3% for both service station attendants and grocery clerks and shelf stockers. The all-occupation average is 15%.

This is an occupational group that provides a lot of part-time employment opportunities. About half of the workers in each of these occupations are employed on a part-time basis. This compares to 26% for the all-occupation average. Overall, 47% of these workers are employed full time, and 53% are employed part time.

The majority of workers in this group are employed in retail trade (83%). Other industries in which they work include wholesale trade (2%) and business services (4%). Overall, 54% are located in the Lower Mainland, 17% are in the Okanagan/Kootenay region, another 19% are on Vancouver Island, and 10% are in Northern B.C. The Lower Mainland has a higher proportion of workers in elemental sales (64%) but a lower proportion of service station attendants (40%). This last figure may reflect a shift toward more self-serve gas stations in the Lower Mainland.

Women account for 63% of elemental sales workers but only 22% of service station attendants and 35% of grocery clerks and shelf stockers. (Women make up 42% of the entire group.) The occupations of service station attendant and grocery clerk and shelf stocker would appear to be entry-level positions attracting mainly young workers. About 76% of service station attendants and 49% of grocery clerks and shelf stockers are under 25. This compares to an all-occupation average of only 15%. The average age of service station attendants is 24, and it is 29 for grocery clerks and shelf stockers. Those working in other elemental sales occupations have an age distribution that is similar to that for the workforce as a whole. The average age for these workers is 39.

Employment Prospects

This is a very large occupational group, made up of about 32,590 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment for this group to grow at an annual rate of 1.8%, about as fast as the average for all occupations. According to this projection, 7,720 positions will become available from 1998 to 2008. Most of these openings (85%) will come from growth in the number of new positions, and the remainder will come from the need to replace workers who retire. Many additional openings will result from worker turnover, a reflection of the relatively low skill requirements, low pay and part-time nature of the work.

Employment growth projections for the three occupations within this occupational group are very similar. Differences in the sizes of these occupations determine how many of the total projected openings are accounted for by each occupation. *Grocery clerks* and *shelf stockers* is the largest of these occupations and accounts for 43% of the projected openings. *Other elemental sales occupations* accounts for 40%, and *service station attendants* accounts for the remaining 17% of the projected openings.

Technology is expected to have a major impact on employment levels for this occupational group. For example, openings for service station attendants, who make up almost one-fifth of this occupational group, will be negatively affected by the increasing use of credit cards at the pump.

Progression to related supervisory positions is possible with additional training or experience.

Related Occupations

service station attendants (6621):

- auto technicians (in 732 motor vehicle mechanics)
- self-serve gas bar cashiers (in 661 cashiers)
- service station managers (in 01/09 middle and other management)
- service station supervisors (in 621 sales and service supervisors)

grocery clerks and shelf stockers (6622):

- cashiers (661)
- meat counter clerk (in 6421 retail salespersons and sales clerks)
- stock handler (in 745 longshore workers and material handlers)
- supervisor, stock clerks (in 621 sales and service supervisors)

other elemental sales occupations (6623):

- cashiers (661)
- retail trade managers (in 01/09 middle and other management)
- retail trade supervisors (in 621 sales and service supervisors)
- kiosk sales clerks (in 6421 retail salespersons and sales clerks)

Working conditions for this occupational group vary depending on specific occupations. Many of these workers spend much of their time working outside. Over half of them are on part-time schedules.

Elemental Medical and Hospital Assistants

NOC 6631

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	1,260	1,810	2,000

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
190	50	240

Annual Growth 1998-2008	1.0%
Main Industries of Employment	
Hospitals	43%
Physicians, and Health Practitioners and Medical Labs	28%
Other Health and Social Services	12%
Employment by Region	
Lower Mainland	63%
Vancouver Island	17%
Northern B.C.	8%
Okanagan/Kootenay	12%
Self-employment	2%

Nature of the Work

Elemental medical and *hospital assistants* perform a variety of support functions to assist health care professionals and other health care staff. They are employed in hospitals, medical clinics and offices of health care professionals, such as chiropractors, occupational therapists and physiotherapists.

Main Duties

Blood donor clinic assistants set up equipment, maintain supplies and record information on donors. They also monitor donors throughout the blood donation procedure under the supervision of a registered nurse, and they label and process donated blood.

Central supply aides collect and sort soiled supplies and instruments from hospital departments. They operate machines, such as instrument washers, sonic sinks, cart washers and steam autoclaves, to clean, reprocess and sterilize these supplies for re-use, and assemble packs of sterile supplies and instruments for delivery to hospital departments.

Chiropractic aides assist patients who are elderly or incapacitated to undress, position patients on a table or chair for treatments by a chiropractor or for machine treatments, and connect treatment machines to patients as directed by a chiropractor. They may also perform clerical duties.

Occupational therapy assistants prepare and maintain work materials and supplies and may assist patients in crafts or other activities as directed by an occupational therapist.

Physiotherapy assistants accompany patients to treatment rooms and assist patients in the use of therapeutic equipment and with maintenance programs as directed and supervised by a physiotherapist. They also clean physiotherapy equipment, change linen, and maintain appointment schedules.

Example Titles

- physiotherapy helper
- occupational therapy aide
- central supply aide
- clinical laboratory helper
- optometrist assistant
- chiropractic aide
- blood donor clinic assistant
- clinic assistant
- physical therapy aide
- supply, processing and distribution aide

Education and Training

Some secondary school education and on-the-job training are required for all occupations in this unit group.

Health care courses or short-term college programs related to the work of medical aides are available and may be required by employers. Camosun College offers an Activity Assistant Certificate program that provides students with the opportunity to develop the knowledge, skills and values necessary to plan and implement, under supervision, individual and group activities. Graduates work with older adults in continuing, long term care and rehabilitation settings. Upon completion of the program, graduates are eligible for a certificate as an Activity Assistant. Okanagan University College also offers a 40-week Rehabilitation Assistant Certificate program that prepares students to work under the supervision of occupational, physical or recreational therapists implementing prepared program activities.

For those wishing to become certified as a medical laboratory assistant, both the University College of the Cariboo and Vancouver Community College (VCC) offer medical laboratory assistant programs. The program at VCC is currently under review, and interested applicants should contact the school for more information.

VCC offers a three-month institutional aide program, which is designed to provide skills training for job opportunities as kitchen helpers and dietary or nourishment aides in institutions, such as long term care facilities, hospitals, hotels and restaurants. Graduates receive training in and qualify for certificates in the Workplace Hazardous Materials Information System of the Workers' Compensation Board of B.C. and also in first aid and Basic Foodsafe.

An expanded version of this program is available for people who want to learn English as a second language. No specific level of previous education is required for admission to the program, but candidates must have basic reading, writing and arithmetic skills, and sufficient skills for effective communication. If English is a second language, an assessment is required. Candidates must also be in good health, have the physical ability to stoop, lift and stretch to perform required duties, and be able to stand for a full working day.

For those who wish to advance in this area, a two-year Nutrition and Food Service Management Diploma is also available at Langara College, designed for individuals who wish to pursue a career in institutional food service management. Graduates of the program are eligible for membership in the Canadian Society of Nutrition Management (CSNM) and corresponding provincial regional associations. The Pacific Society of Nutrition Management (PSNM) is the association for British Columbia, and graduates must be a member of the CSNM in order to be eligible for the provincial associations.

Physical therapy assistants require stamina, patience, creative imaginations and determination. They must be able to work as a member of a health care team, deal with people under stress, follow directions closely and maintain a patient's confidence and enthusiasm. Assistants need to be adaptable to meet the needs of both physical therapists and patients. Good communication skills, both oral and written, are important. Physical therapy assistants need to be physically fit, know proper methods for lifting and carrying patients, be open to the suggestions of others and have good manual dexterity.

Dietary aides in medical establishments generally like to organize and keep things running smoothly, which involves meeting schedules. Aides must be reliable, able to follow written and spoken instructions and in good physical shape to work on their feet, lift trays and bend.

Nourishment aides in medical establishments should like working with people and have good hand-eye coordination. They need to be in good shape, able to lift and push heavy objects and able to follow instructions, both written and spoken. Reading and writing skills are needed when filling in simple reports and taking accurate measurements.

Training is provided on the job. Employers prefer to hire high school graduates. General knowledge about the B.C. health care system or experience in working with individuals with disabilities can be an asset.

Working Conditions

Elemental medical and *hospital assistants* work in a well-lit, clean environment. They constantly interact with other people and may have to handle several responsibilities at once.

Most full-time elemental medical and hospital assistants work a regular 37.5 hour week. Some work evenings and weekends.

In 1995 the average annual earnings for all workers in this occupational group were $24,700. Over half (55%) of these assistants worked full time for the whole year, and their earnings were $30,600 on average. The respective all-occupation averages were $27,900 and $39,400. According to a recent survey of college graduates who found work in this occupational group, the average earnings were $1,700 per month, based on 26 hours per week.

The number of employed workers rose 44%, from 1,260 in 1990 to 1,810 in 1998. At about 2%, self-employment among the members of this group is almost non-existent.

The work pattern for people in this occupational group is 73% full time and 27% part time, which is very similar to the workforce average. The rate of unemployment is below the average for all occupations.

The largest concentration of workers in this group are found in hospitals (43%). Other employers of these workers include physicians, other health practitioners and medical labs (28%), as well as health and social services (12%).

Regional distribution of this group has a slightly higher emphasis in the urban areas of Victoria and Vancouver than the all-occupation average. There are 63% of the workers located in the Lower Mainland, 12% in Victoria, 5% on the rest of Vancouver Island, 12% in the Okanagan/Kootenay region and 8% in Northern B.C.

Women account for the vast majority (85%) of the workers in this group. Workers in this occupational group are somewhat older than average. Only 4% of the workers are under 25, and 44% are over 44. The all-occupation averages are 15% under 25 and 32% over 44. The average age is 42.

Employment Prospects

This is a small occupational group, made up of about 1,810 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment for this group to grow at an annual rate of 1.0%, slower than the average for all occupations. According to this projection, 240 positions will become available from 1998 to 2008. About three-quarters of these openings will come from growth in the number of new jobs. The remainder will come from the need to replace workers who retire. Many additional openings will become available due to worker turnover.

Hospitals employed almost 45% of all *elemental medical* and *hospital assistants* in the province in 1998. Slower than average employment growth in this industry is partly responsible for the low employment growth of these workers. Physicians, health practitioners and medical labs together employed almost 30% of these workers in 1998. The combined employment of these three groups is expected to grow at a rate close to the all-industry average. Employment of these workers is also particularly susceptible to advances in technology because they work so closely with medical equipment.

Many physicians prefer to hire elemental medical and hospital assistants who have formal training or experience, particularly those with certification. It is possible for these workers to progress to occupations such as aides and assistants in support of health services.

Related Occupations

- other aides and assistants in support of health services (3414)

Food Counter Attendants and Kitchen Helpers

NOC 664

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	33,920	41,630	49,830

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
8,200	4,660	12,860

Annual Growth 1998-2008

1.8%

Main Industries of Employment

Accommodation and Food Services	84%
Hospitals	6%
Other Health and Social Services	4%

Employment by Region

Lower Mainland	57%
Vancouver Island	19%
Northern B.C.	9%
Okanagan/Kootenay	16%

Self-employment

2%

Nature of the Work

Food service counter attendants and *food preparers* prepare, heat and finish cooking simple food items and serve customers at food counters. Kitchen and food service helpers clear tables, clean kitchen areas, wash dishes and perform various other activities to assist workers who prepare or serve food and beverages. Workers in these occupations are employed in restaurants, hotels, fast food outlets, cafeterias, hospitals and other establishments.

Main Duties

Food service counter attendants and *food preparers* take customers' orders and prepare food, such as sandwiches, hamburgers, salads, milk shakes and ice cream dishes. They serve customers at counters or buffet tables and may receive payment for food items purchased.

This group also includes kitchen and food service helpers. Kitchen helpers wash and peel vegetables and fruit, they wash work tables, cupboards and appliances, and they remove trash and empty kitchen garbage containers. They also unpack and store supplies in refrigerators, cupboards and other storage areas, they sweep and mop floors, and they perform other duties to assist cooking and kitchen staff.

Food service helpers clear and clean tables and trays in eating establishments and bring clean dishes, flatware and other items to serving areas and set tables. They replenish condiments and other supplies at tables and serving areas and remove dishes before and after courses. They also perform other duties, such as scraping and stacking dishes, carrying linen to and from laundry areas and running errands.

Dishwashers wash dishes, glassware, flatware, pots and pans using a dishwasher or by hand. They place dishes in storage areas, scour pots and pans, and may clean and polish silverware.

Example Titles

food service counter attendants and food preparers (6641)

- cafeteria counter attendant
- food counter attendant
- ice cream counter attendant
- salad bar attendant
- food preparer
- fast-food preparer
- sandwich maker

kitchen and food service helpers (6642)

- cook's helper
- dishwasher
- kitchen helper
- bus boy/girl
- food service helper
- bartender helper

©Stone/Vancouver

Education and Training

These positions are considered entry-level in the food preparation field, and there are no minimum educational requirements. However, some related education is generally required for advancement in the field. A language other than English is often a strong asset.

Food service counter attendants usually require some secondary school education and need to be friendly, reliable and helpful. They need to be able to follow instructions, both written and spoken, and be in good enough physical shape to stand for periods of six to eight hours. Cash register skills, computer skills and communication skills are very important. High school preparation may involve courses in home economics, nutrition, English, mathematics and reading. Counter attendants are trained on the job by experienced employees, and the training usually takes from three weeks to a month.

Employers tend to seek *kitchen* and *food service helpers* with at least grade 10, but graduation from high school is preferred. Helpers must be in good health and interested in food preparation. Reading recipes and instructions, reviewing safety information and weighing and measuring ingredients are tasks that require basic reading and writing skills. Workers need to be in good enough physical condition to lift heavy pots and trays of dishes. Neatness, cleanliness and a willingness to follow safety procedures are essential in maintaining the high standards necessary in all food establishments.

Catering helpers are usually required to have some experience in the food and beverage industry. They need to be creative and flexible with problem-solving skills. Cood communication skills are important because catering requires a great deal of interaction with the public. Writing skills and basic mathematics are also important. Specific orders must be carefully written down along with a record of the customer's instructions about the event. A driver's licence may also be required.

Work as a *dishwasher* is often an entry-level position to work in the kitchen and may involve a combination of dishwashing and kitchen helper duties, particularly in smaller establishments. An ability to lift heavy dishes, spend many hours standing and get along well with other workers are prerequisite skills for this type of work. Dishwashers must work quickly and carefully and be able follow orders from the chef, cook or restaurant manager. Dishwashers need to be able to handle routine, as duties are about the same every day. It takes three to five days to learn all the duties of a dishwasher, including the operation of an industrial dishwasher.

Vancouver Community College (VCC) offers a three-month institutional aide program that is designed to provide skills training for job opportunities as kitchen helpers in institutions, such as long term care facilities, hospitals, hotels and restaurants. Graduates receive training in and qualify for certificates in the Worker's Compensation Board of B.C.'s Workplace Hazardous Materials Information System, first aid and Basic Foodsafe.

An expanded version of this program is available for people who want to learn English as a Second Language. No specific level of previous education is required for admission to the program, but candidates must have basic reading, writing and arithmetic skills, and sufficient skills for effective communication. If English is a second language, an assessment is required. They must also be in good health and have the physical ability to stoop, lift and stretch to perform required duties and be able to stand for a full working day.

Douglas College's Continuing Education Division offers three relevant programs. Food Service in Health Care is a 60-hour program that addresses food service in a variety of health care settings. Meal Management for Group Homes is a 12-hour program for staff and operators of small residential homes. Basic Food Safe is offered for food service workers, and Advanced Food Safe is offered for supervisors and managers who work in restaurants or in health care facilities.

Douglas College, Malaspina University College and VCC all offer programs for adults who have special learning needs to prepare for employment in the food service and hospitality industries. Work experience in a community food service establishment is included in some of the programs. Admission usually requires an initial assessment of learning skills and career interests.

Most public colleges offer professional cooking or culinary arts programs that last less than one year. Grade 10 or equivalent is required for admission, but grade 12 is preferred. In some of the larger programs it is possible to take only the first level of the program, which teaches basic cooking skills and prepares students for employment in family restaurants, cafeterias and fast food operations. After successful completion of level one, students may choose to enroll for further training in the next level. Apprenticeships are also available. For details about these programs, see the profile Chefs and Cooks (624).

Working Conditions

Food counter attendants and *kitchen helpers* often work in difficult conditions. Many food service locations have modern equipment and convenient work areas, but others are not as well equipped. Workers must often face the pressure and strain of working in close quarters during busy periods, standing for hours at a time, working in hot or steamy environments, lifting heavy pots, kettles and trays, and working near ovens and grills.

Health and safety procedures must be strictly followed to avoid injury from sharp utensils and hot appliances. The temperature of the working environment may vary from cool refrigeration units to hot dishwashing and cooking equipment. Valued skills include speed, neatness, cleanliness and a demonstrated interest in food preparation.

Part-time work is common. Over 60% of food counter attendants and kitchen helpers work part time. Work hours in restaurants may include late evening, weekend and holiday work. Some may work on call or work split shifts (work for several hours, take a few hours off and then return to work). However, flexibility in scheduling can be attractive to many people, such as students, homemakers and retirees. Work hours in cafeterias and institutions may be more regular.

Average 1995 earnings were $7,000 for food service counter attendants and food preparers and $9,900 for kitchen and food service helpers. These average figures reflect a lower pay rate and the high proportion of part-time employment. The comparable all-occupation average is $27,900. Overall, only 16% of the workers in this occupational group are employed full time for the full year. Earnings for those employed full time for the whole year were $16,100 for food service counter attendants and food preparers and $20,200 for kitchen and food service helpers. The comparable earnings for the all-occupation average were $39,400. According to a recent survey of college graduates who found work as food service counter attendants and food preparers, the average level of earnings was $920 per month, based on 25 hours per week. Those who found work as kitchen and food service helpers reported an average level of earnings of $1,060 per month, based on 27 hours per week.

In some large restaurants and hotels workers belong to unions, so they may receive higher wages. Food service counter attendants and kitchen helpers can also supplement their earnings with customer tips. The amount of tips they receive varies depending on the type of work and establishment. In some establishments, such as large hotels, waiters and waitresses contribute some of their tips to a tip pool, which is distributed among other food and beverage service workers and kitchen staff. However, workers at fast food outlets are usually paid minimum wage rates and do not receive tips.

This is a very large occupational group in B.C. The number of employed workers rose 23% from 33,920 in 1990 to 41,630 in 1998. Food service counter attendants and food preparers represent 56% of the workers and kitchen and food service helpers represent 44%. Workers in these occupations are very rarely self-employed.

These two occupations have a seasonal component and provide a substantial number of part-time employment opportunities, particularly for high school and post secondary students. Overall, only 37% of the workers are employed full time, while the majority (63%) work part time. In addition, 48% of the workers are employed part time for part of the year. These part-time figures compare with the all-occupation averages of 26% part time and 18% part time, part year. The unemployment rate is about the same as the average for all occupations.

Workers are employed mainly in accommodation and food services (84%). Some are also employed in hospitals (6%), other health and social services (4%) and amusement and recreation services (3%). The regional distribution of workers is close to that for all occupations. About 57% are located in the Lower Mainland, 18% are on Vancouver Island, 16% are in the Okanagan/Kootenay region, and 9% are in Northern B.C.

Workers in these occupations are mainly women. They represent 63% of the entire group, 69% of food service counter attendants and food preparers and 55% of kitchen and food service helpers. Young people are well represented in this group of occupations. About 70% of the food service counter attendants and food preparers are under 25, and 45% of the kitchen and food service helpers are under 25. This is more than three times the provincial average for young workers (15%). The average age for food service counter attendants and food preparers is 25. The average age for kitchen and food service helpers is 31.

Employment Prospects

This is a very large occupational group, made up of about 41,630 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment for this group to grow at an annual rate of 1.8%, about as fast as the average for all occupations. According to this projection, 12,860 positions will become available from 1998 to 2008. About two-thirds of these openings will come from growth in the number of new jobs. Many additional openings will result from the high amount of worker turnover in this field. This is a reflection of the relatively low skill requirements, low pay and part-time nature of the work.

A little over half of all workers in this group were *food service counter attendants* in 1998. Employment of these workers is growing faster than the average for all occupations. A total of 7,890 openings are projected to become available for these workers over the projection period. *Kitchen* and *food service helpers* account for the remaining 4,950 openings that are projected to become available. This group is projected to grow at a rate close to the all-occupation average.

Rapid employment growth in the accommodation and food services industry, which employed over 80% of all *food counter attendants* and *kitchen helpers* in 1998, accounts for most of the projected openings. There are a number of factors driving growth in this industry. Increases in the number of double income families have led to both higher discretionary incomes and less time available to prepare meals at home. These factors have contributed to families eating out more frequently. A rapidly growing tourism sector is also contributing to growth in this industry. According to Tourism B.C, nearly twenty-two million overnight visitors who visited B.C. in 1998 spent $8.8 billion, an increase of 3.5% from 1997. The weak Canadian dollar is expected to attract a growing number of U.S. and European tourists to B.C. Canadian travelers will also have an added incentive to travel domestically, and B.C. is a popular tourist destination in Canada. According to industry sources, about 8.5% more tourists came to B.C. on cruise ships in 1999 than in 1998, and 75% of these tourists deemed eating in restaurants a favourite activity.

A further source of employment growth of this occupational group is the growing and aging B.C. population. Studies show that people over 50 years of age eat out three times a week on average.

The food service industry has relied heavily on young people as its main source of labour. With changing demographics, there will be proportionately fewer young people available to work in this field. Fast food companies, such as MacDonalds, now are actively recruiting older workers and even retired workers who are available for part-time work.

Some establishments in the food service industry, such as large hotels and restaurants, are taking proactive measures to address human resource management issues. For example, improving the level of training has been shown to help in recruiting and retaining workers. As a consequence the industry is becoming more attractive as a long-term career for new entrants to the job market. Improving the level of training has been shown to help in recruiting and retaining workers.

Career progression is possible for those employed as *food counter attendants* and *kitchen helpers*, which are often considered entry-level occupations. There is considerable mobility among jobs in food service occupations. Movement into other higher paying occupations in food and beverage services, such as cook or waiter, is possible with further training and experience. With more formal education and training career progression can also lead to supervisory occupations or even restaurant and food service management occupations.

Related Occupations

- food service counter attendants and food preparers (6641)
- chefs (in 624 chefs and cooks)
- cooks (624 chefs and cooks)
- kitchen and food service helpers (6642)
- food and beverage servers (in 645 occupations in food and beverage service)

Security Guards and Related Occupations

NOC 6651

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	6,100	7,510	7,560

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
50	1,800	1,850

Annual Growth 1998-2008	0.1%
Main Industries of Employment	
Other Business Services	56%
Accommodation and Food Services	8%
Retail Trade	5%
Employment by Region	
Lower Mainland	63%
Vancouver Island	18%
Northern B.C.	9%
Okanagan/Kootenay	10%
Self-employment	3%

Nature of the Work

Security guards and *other related workers* guard property against theft and vandalism, control access to establishments, maintain order and enforce regulations at public events and within establishments. This occupation also includes gate attendants, bodyguards, bouncers, commissionaires and crossing guards. They are employed by private security agencies, retail stores, industrial establishments, museums and other establishments.

Main Duties

The duties of people in these occupations may require them to control access to establishments, issue passes and direct visitors to appropriate areas. They may patrol assigned areas to guard against theft, shoplifting, vandalism and fire. They may enforce regulations of an establishment to maintain order or perform security checks of passengers and luggage at airports. They may drive and guard armoured trucks and deliver cash and valuables to banks, automated teller machines and retail establishments. They may also supervise and coordinate the activities of other security guards.

Example Titles

- airport security guard
- security officer
- armoured car guard
- preboarding security guard
- gate attendant
- security guard
- crossing guard
- night watchman/woman
- bouncer
- bodyguard
- commissionaire

Education and Training

All employees of security guard service firms must be licensed by the B.C. Solicitor General. Fingerprints are checked with municipal police departments or the Royal Canadian Mounted Police, and a criminal record check is completed. Most employers also require that guards be bondable.

Most employers prefer to hire people who have at least a high school education. Armoured car drivers must be 21 years of age or older, be bondable, have a driver's licence with a clean driving record, be emotionally and physically fit, be skilled in the use of a firearm and have truck driving experience. Training is provided for airport security guards and may be provided for other occupations in this group.

The Justice Institute of British Columbia (JIBC) offers a Basic Private Security Certificate, which provides students with the basic knowledge and skills needed to work as a *security guard*. This program involves two separate courses. Students who complete both courses have educational requirements for obtaining a security patrol (security guard) licence in B.C. Graduates receive a certificate of training completion issued on behalf of the provincial government by JIBC. To be granted a security guard licence, applicants must first apply for a job and get sponsored by their employer. All licences are issued by the Attorney General. In addition to the educational requirements above, applicants must be at least 19 years old, without a criminal record and provide a ten-year work and residency history.

Senior security guards and supervisors require experience. Security guards carrying firearms require a licence. Most security guards are trained on the job, but having some related training prior to employment is a definite asset, particularly for later advancement. Some security agencies have no minimum education requirements but they do require applicants to speak and write English, be 18 years of age or older, have good character references and no police record and be in good health.

Security guards need to have a sense of responsibility and good judgement. They should enjoy serving the public, have an ability to work independently, pay attention to detail and have good communication skills, including tact and discretion. Security guards need to be able to follow instructions precisely, work long hours and stay alert. A basic understanding of the legal system is an asset. Honesty, integrity, punctuality, an ability to act calmly in an emergency and to work well under pressure are all traits of a successful security guard.

Working Conditions

Guards work indoors and outdoors patrolling buildings, industrial plants and grounds. Indoors, they may be stationed at a guard desk to monitor electronic security and surveillance devices or to check the credentials of persons entering or leaving the premises. They also may be stationed at gate shelters or may patrol grounds in all weather.

Because guards often work alone, there may be no one nearby to help if an accident or injury occurs. Some large firms therefore use a reporting service that enables guards to be in constant contact with a central station outside the plant. If they fail to transmit an expected signal, the central station investigates. Guard work is usually routine, but guards must be alert constantly for threats to themselves and to the property that they are protecting.

Guards who work during the day may have a great deal of contact with other employees and members of the public. However, many guards work alone at night, and the usual shift lasts eight hours. Some employers have three shifts, and guards rotate to divide daytime, weekend and holiday work equally. Guards usually eat on the job instead of taking regular breaks.

In 1995 the average annual earnings for all workers in this occupational group were $17,600 in B.C., with the 39% who worked full time for the whole year receiving $25,700 in earnings. The respective all-occupation averages were $27,900 and $39,400. According to a recent survey of college graduates who found work in this occupation, the average earnings were $1,460 per month, based on 32 hours per week. At this level of earnings, an individual would earn $17,500 per year.

In 1998 there were 7,510 people employed as security guards and in related occupations, a 23% increase over 1990.

Very few security guards are self-employed. About 67% of security guards are employed on a full-time basis, and 33% work part time, compared to the all-occupation averages of

74% for full-time and 26% for part-time work. The unemployment rate is about the same as the average for all occupations. While half (51%) of security guards work only part of the year, compared to 45% of the workforce as a whole, the difference is in the higher percentage of people in this occupation who work part time for only part of the year (24%). Employment in this occupation is moderately sensitive to overall business conditions.

Most security guards work in other business services (56%), such as security and investigation services. Other industries in which they are employed include accommodation and food services (8%), retail trade (5%) and education (5%).

The regional distribution of workers in this group is reasonably similar to that for the workforce as a whole. There are 63% of the workers located in the Lower Mainland, 18% on Vancouver Island, 10% in the Okanagan/Kootenay region and 9% in Northern B.C.

This occupational group is dominated by men who make up 84% of the workers. The age distribution of workers is somewhat different than the average. There are more workers under the age of 25 (20%), compared to the average for all occupations (15%). In addition, 23% are over 54 years of age, compared to only 11% for the workforce as a whole. The average age is 40.

Employment Prospects

This is a large occupational group, made up of about 7,510 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment for this group to grow at an annual rate of 0.1%, slower than the average for all occupations. According to this projection, 1,850 positions will become available from 1998 to 2008. Almost all of these openings will come from the need to replace workers who retire, and only a few will come from growth in the number of new jobs. Many additional openings will result from a high rate of worker turnover.

Several factors could act to increase the employment growth rate of *security guards* and *related occupations* above the COPS forecasted rate. The other business services industry, which employed over 56% of these workers in 1998, is experiencing much faster than average employment growth. Funding constraints affecting police forces, in conjunction with public concerns over crime and vandalism, potentially could increase the demand for *security guards* in and around plants, stores, offices, residential communities and recreation areas.

Increasing business investment in expensive equipment and machinery is also expected to result in a higher demand for *security guards*. Demand for these workers will also grow as private security firms perform duties (such as monitoring crowds and providing security) formerly handled by government police officers.

It is often much easier and less costly for companies to contract services from an agency than to assume direct responsibility for hiring, training and managing a security guard force. For this reason, job growth is expected to be concentrated among security guard firms and agencies that contract to provide various security services.

Security guards employed by security guard firms are occasionally laid off when the company at which they patrol does not renew its contract with their security guard firm. Guards employed directly by a company office, plant or factory (in-house guards) are seldom laid off when business slows because a plant or factory must be protected even when economic conditions force it to close temporarily.

Competition for openings in this line of work is particularly strong for the generally higher paying in-house guard positions. In addition to enjoying higher earnings and benefits, in-house guards have greater job security and more advancement potential than contract security guards. In addition, in-house guards usually are provided with more training and responsibility.

Progression to supervisory positions is possible with additional experience and in-house training.

Related Occupations

- correctional service officers (in 646 other occupations in protective service)
- private investigators (in 646 other occupations in protective service)
- managers of security agencies (in major group 01/09 middle and other management)

Cleaners

NOC 666

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	43,640	56,270	65,920

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
9,650	10,660	20,310

Annual Growth 1998-2008 1.6%

Main Industries of Employment

Other Service Industries	30%
Accommodation and Food Services	19%
Education	9%

Employment by Region

Lower Mainland	50%
Vancouver Island	19%
Northern B.C.	12%
Okanagan/Kootenay	19%

Self-employment 15%

Nature of the Work

This occupational group includes three unit groups.

Light duty cleaners clean the lobbies, hallways, offices and rooms of hotels, hospitals, schools, office buildings and private residences. They are employed by hotels, motels, hospitals, school boards, office building management companies and cleaning service companies.

Specialized cleaners clean and refurbish building exteriors, carpets, chimneys, industrial equipment, railway cars, ventilation systems, windows and other surfaces using specialized equipment and techniques. They are employed by specialized cleaning services companies or may be self-employed.

Janitors, caretakers and *building superintendents* clean and maintain the interior and exterior of commercial, institutional and residential buildings and their surrounding grounds. They are employed by office and apartment building management companies, school boards, hospitals, recreational facilities, shopping malls and other establishments.

Main Duties

Light duty cleaners sweep, mop, wash, wax and polish floors and vacuum carpeting, area rugs, draperies and upholstered furniture. They dust furniture, make beds, change sheets, pick up debris and empty trash containers. They also distribute clean towels and toiletries. They clean, disinfect and polish kitchen and bathroom fixtures and appliances, and they disinfect operating rooms and other hospital areas.

The duties of *specialized cleaners* vary according to their specific occupation. Carpet and upholstery cleaners operate machines to clean carpets, rugs and upholstered furniture on customers' premises or in carpet and upholstery cleaning establishments. Chimney cleaners clean soot and creosote from chimneys and fireplaces using hand tools and industrial vacuum cleaners. Furnace and ventilation system cleaners clean ducts, vents and filters of furnaces in residences and commercial buildings also using hand tools and industrial vacuum cleaners. Sandblasters clean building exteriors, tanks, chimneys and industrial equipment using sandblasting, pressurized steam or hydroblasting equipment. Vehicle cleaners clean the interior and exterior of automobiles and trucks at car washes and car dealerships. Window cleaners wash and clean interior and exterior windows and other glass surfaces in low-rise and high-rise buildings.

Janitors, caretakers and *building superintendents* sweep, mop, scrub and wax hallways, floors and stairs, and they operate industrial vacuum cleaners to remove scraps, dirt, heavy debris and other refuse. They empty trash cans and other waste containers. They wash windows, interior walls and ceilings. They clear snow and ice from walkways and parking areas. They cut grass, and they tend grounds. They also clean and disinfect washrooms and fixtures. They make adjustments and minor repairs to heating, cooling, ventilating, plumbing and electrical systems, and they perform other routine maintenance jobs and repairs, such as painting. In addition, they may advertise vacancies, show apartments and offices to prospective tenants and collect rent.

Example Titles

light duty cleaners (6661):

- sweeper
- cleaner
- hotel cleaner
- house cleaner
- office cleaner
- room attendant
- hospital cleaner

specialized cleaners (6662):

- ventilation system cleaner
- chimney cleaner
- furnace cleaner
- window cleaner
- building exterior cleaner
- freight car cleaner
- septic tank cleaner
- carpet cleaner
- upholstery cleaner
- vehicle cleaner
- laboratory equipment cleaner
- sandblaster

janitors, caretakers and building superintendents (6663):

- building caretaker
- industrial cleaner
- plant cleaner
- handyman/woman
- heavy-duty cleaner
- custodian

Education and Training

There are no specific educational requirements for cleaners and janitors. Grade 10 or an equivalent is the minimum education preferred by most employers. Training is provided on the job and may last up to 30 days. Often cleaners and janitors need to have a criminal record check and to be eligible for bonding.

Cleaners and *janitors* need to be good with their hands, be strong enough to move heavy furniture and have the physical ability to operate machinery and to stoop, kneel, crouch and reach while cleaning. People with allergies to cleansers may have difficulty doing this work. Good eyesight and an ability to work quickly with care are required. Cleaners need to be well-organized and able to deal with frequent interruptions and still get work done. They also need to be able to follow instructions and work well on their own.

Specialized cleaners, such as laboratory cleaners, car detailers, window cleaners and housekeeping/room attendants in tourist establishments, are usually trained on the job. They may be required to have previous experience in a related position. Laboratory cleaners may need to learn specialized cleaning procedures. Car detailers may need to have a driver's licence. Window cleaners generally need to be agile with a strong back, not afraid of heights and able to follow safety procedures.

Certification is available, but not mandatory, for housekeeping/room attendants. Granted by the Pacific Rim Institute of Tourism following a written examination, a skill review and an evaluation by a trained volunteer, certification acknowledges that a person has the level of knowledge, skills and attitude acceptable by industry standards. The Institute can be contacted at 800 - 1185 West Georgia Street, Vancouver, B.C., V6E 4E6 or call (604) 682-8000 or fax (604) 688-2554.

Those operating a house cleaning business must be good at organizing and scheduling, have some basic bookkeeping skills and enjoy contact with people.

Janitors, *caretakers* and *building managers/superintendents* usually require one or two years of high school. Basic math and reading skills are needed for reading labels and filling in simple reports. Janitors with grade 12 will find it easier to get work, and a high school diploma is often required to advance or supervise others.

See the profile Property Administrators (1224) for more details about possible career directions.

Some occupations in this group, such as building superintendents, require previous cleaning and maintenance experience. While most workers receive about one month of on-the-job training, there is an increasing demand for skilled employees.

Vancouver Community College (VCC) offers a three-month Building Service Worker Program that trains students to work as janitors or cleaners. Admission requirements include grade 10 or equivalent. A six-month extended version of the program is offered to students with disabilities. There is also a five-month version of this program for students who need extra English as a Second Language Training to earn the Building Service Worker Certificate. VCC's Continuing Education division offers a part-time Building Manager (Residential) certificate program.

Kwantlen University College offers a Building Service Worker program designed for those who wish to enter building service work. Both Selkirk College and VCC offer the Institutional Aide Certificate, which provides students with the training necessary for employment as kitchen helpers, cleaners, housekeeping and laundry aides in restaurants, long term care facilities and commercial laundries.

Because the tasks of janitors are quite varied, a knowledge of electrical systems, plumbing, carpentry and other construction trades is an asset. An ability to operate industrial machinery and the ability to communicate effectively with others are important skills. Analytical skills and adaptability to change are assets. Janitors need to be able to work on their own with little or no supervision.

Courses in first aid and Workplace Hazardous Materials Information Systems (WHMIS) are highly recommended for all janitors and custodial occupations. Specific training about particular repair and maintenance of equipment may be part of the on-going training for people in these occupations.

Some technical schools and colleges have part-time night school courses in caretaking and janitorial work.

Working Conditions

Most office buildings are cleaned when they are empty, which means that many cleaners work evening hours. Some cleaners, such as school and hospital custodians, work in the daytime. When there is a need for 24-hour maintenance, janitors may be assigned to shifts. Most full-time janitors and cleaners work about 40 hours a week. Part-time cleaners often work evenings and on weekends.

Janitors and *cleaners* usually work inside heated, well-lighted buildings. However, sometimes they work outdoors sweeping walkways, mowing lawns or shoveling snow. Working with machines can be noisy, and some tasks, such as cleaning bathrooms and trash rooms, can be dirty and unpleasant. Janitors may suffer minor cuts, bruises and burns from machines, hand tools and chemicals.

Janitors and cleaners spend most of their time on their feet, sometimes lifting and pushing heavy furniture and equipment. Many tasks, such as dusting and sweeping, require constant bending, stooping and stretching.

In 1995 the average annual earnings for workers in this occupational group were $12,200 for light duty cleaners, $13,300 for specialized cleaners and $17,700 for janitors, caretakers and building superintendents. These levels of earnings tend to be lower than the comparable all-occupation average ($27,900) because of lower pay rates and the high level of part-time employment involved. Those who worked full time for the whole year earned an average of $21,400 as light duty cleaners, $22,600 as specialized cleaners and $27,700 as janitors, caretakers and building superintendents. The comparable all-occupation earnings were $39,400. The relatively higher average earnings for janitors, caretakers and building superintendents reflect their additional responsibilities.

According to a survey of recent college graduates who found work in this occupational group, the average reported earnings were $1,420 per month, based on 28 hours worked a week for light duty cleaners. Specialized cleaners earned $1,550 per month, based on 33 hours worked a week. Janitors, caretakers and building superintendents earned $1,830 per month, based on 32 hours worked a week.

The number of employed workers in this very large occupational group rose 29%, from 43,650 in 1990 to 56,270 in 1998. Janitors, caretakers and building superintendents account for 60% of this group, while light duty cleaners make up 31%, and specialized cleaners make up the final 9%. Overall, the level of self-employment for all workers in this group is 15%, the same as the average for all occupations in B.C. However, 22% of specialized cleaners report being self-employed.

This occupational group provides a significant source of part-time work. The part-time employment involves 42% of the workers and represents in excess of 23,300 people. In addition, about 35% of light duty cleaners and 31% of specialized cleaners work part time for only part of the year. Overall, 58% of all the workers are employed full time, and 42% are employed part time. The comparable averages for all occupations are 74% full time and 26% part time. The average rate of unemployment for all workers is about the same as the average for all occupations. However, it is higher for specialized cleaners.

Cleaners are employed in many different industries, with the largest concentrations working in other service industries (30%), accommodation and food services (19%), education (9%) and hospitals (7%). At an individual occupation level, the primary industry for light duty cleaners is hospitality (43%), for specialized cleaners it is retail trade (44%), and for janitors, caretakers and building superintendents it is other service industries (36%), which includes buildings and dwellings services. The Lower Mainland is home to 50% of the workers, Vancouver Island is where 19% are based, the Okanagan/Kootenay region is the location for 19%, and Northern B.C. claims 12%.

Women make up almost half of this group, but their representation varies across the occupations. Women dominate light duty cleaners (86%). However, they only account for 15% of specialized cleaners and 36% of janitors, caretakers and building superintendents. Overall, the age distribution of cleaners is reasonably similar to the average for all occupations. However, the specialized cleaners group has a very high proportion of workers under 25 (43%), compared to the all-occupation average of 15%. The cleaners' average age is 39, but specialized cleaners average only 30 years of age.

Employment Prospects

This is a very large occupational group, made up of about 56,270 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment for this group to grow at an annual rate of 1.6%, about as fast as the average for all occupations. According to this projection, 20,310 positions will become available from 1998 to 2008. About half of these openings will come from the need to replace workers who retire. and half will come from growth in the number of new jobs. Many additional openings will result from worker turnover, a reflection of the relatively low skill requirements, low pay and often part-time nature of the work. These factors make this occupational group relatively easy to enter.

Most workers in this occupational group were either *janitors, caretakers* or *building superintendents* in 1998. Openings in these occupations account for 61% of the projected openings. *Light duty cleaners* account for 32%, and *specialized cleaners* account for the remaining 7% of the projected openings.

The highest growth rate is expected for cleaners who work in the growing accommodation sector due to rapid growth in tourism. Employment in government-funded fields, such as education and health (hospitals), is expected to grow more slowly than in any other field due to budgetary concerns at all levels of government.

New technology is expected to have little effect on the employment of *cleaners*. Robots are limited to a single cleaning task and may not be usable in many places, particularly cluttered areas such as hotel and hospital rooms.

Interpersonal skills are very important for *janitors, caretakers* and *building superintendents*. Employers often prefer persons with some construction background and those who can undertake building maintenance to fill positions in these occupations.

Progression to supervisory cleaning positions is possible with additional training or experience.

Additional Information

For cleaners in the hospitality industry see:
Pacific Rim Institute of Tourism http://www.prit.bc.ca

Related Occupations

- cleaning supervisors (in 621 sales and service supervisors)

Other Attendants in Travel, Accommodation and Recreation

NOC 667

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	2,810	3,920	5,020

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
1,100	2,320	3,420

Annual Growth 1998-2008 2.5%

Main Industries of Employment	
Amusement and Recreation Services	59%
Accommodation and Food Services	12%
Local and Other Administration	9%

Employment by Region	
Lower Mainland	58%
Vancouver Island	16%
Northern B.C.	7%
Okanagan/Kootenay	19%

Self-employment 3%

Nature of the Work

This group includes *attendants* in *amusement, recreation* and *sport*. Operators of amusement rides, games and other attractions, and workers in gambling casinos are employed by amusement parks, fairs, exhibitions, carnivals and gambling casinos, or they may be self-employed. Supervisors of gambling casino workers are included in this group. Attendants in recreational and sport facilities assist patrons, collect tickets and fees, and supervise the use of recreation and sports equipment. They are employed by amusement parks, arenas, billiard parlours, bowling alleys, golf courses, ski centres, tennis clubs and other recreational and sports facilities.

This group also includes *attendants* in *accommodation* and *travel (except airline travel)* who carry hotel guests' luggage and escort guests to their rooms, carry travellers' luggage at railway stations and aboard ships, and clean and maintain public areas and passengers' rooms aboard ships and trains. They are employed by hotels, railway companies and water transport companies.

©Stone/Vancouver

Main Duties

Attendants in *amusement, recreation* and *sport* include amusement attraction operators who drive vehicles to transport amusement rides, games and other attractions to amusement attraction sites. They set up rides and other amusement attractions and perform routine maintenance and safety inspections of attraction equipment. They also operate rides and other attractions, oversee game activities and ensure the safety of participants. They may supervise amusement attraction attendants and sell tickets. Included as well are amusement park attendants, who collect tickets and admit patrons to amusement parks and rides, assist patrons to get on and off rides, and secure and release safety belts and bars.

Another occupation included in this group are workers in gambling casinos who operate gambling tables and games, such as roulette, blackjack, keno and baccarat. They ensure that the rules of the games are followed. They may supervise staff, train new dealers and monitor gambling tables.

Attendants in *recreation* and *sport* include ski lift attendants who operate ski lifts, assist passengers on and off lifts, and monitor equipment to detect wear and damage. They also include ice makers who prepare the ice surfaces of rinks for activities such as skating, hockey and curling. Recreational facility attendants schedule the use of golf courses, tennis courts, fitness clubs and other recreational facilities, such as bowling alleys. They may collect fees from players and sell or rent sports equipment.

Other attendants in *accommodation* and *travel* include bellhops, who carry luggage for hotel guests, escort incoming guests to their rooms, check rooms to ensure that they are in order, and offer information regarding features of rooms, services of the hotel and points of interest. Baggage porters convey travellers' luggage at railway stations by hand or hand truck and arrange for ground transportation. Train service attendants set and clear tables in dining cars, clean sleeping cars, maintain washroom supplies and assist passengers as required. Ship attendants serve food and beverages, clean cabins, make beds, wash dishes and carry luggage for passengers aboard ships.

Example Titles

attendants in amusement, recreation and sport (6670):

- amusement ride operator
- game concession operator
- amusement park attendant
- bingo hall attendant
- card dealer
- bowling alley attendant
- recreation attendant
- sport attendant
- ski lift attendant
- tennis court attendant
- ice maker
- campground attendant

other attendants in accommodation and travel (except airline travel) (6672):

- bellhop
- doorkeeper, hotel
- guest services attendant, hotel
- passenger attendant
- luggage attendant
- train service attendant

Education and Training

Some secondary education may be required for *attendants* in *recreation* and *sport facilities*. Basic reading, writing and mathematic skills are usually necessary for daily tasks. Amusement park attendants, ski lift operators and recreational facility attendants require an ability to communicate effectively with a variety of people. They are sometimes required to handle complaints and need to be able to listen calmly and patiently and avoid acting defensively. An outgoing and friendly attitude is important. They need to be able to follow instructions and make simple progress reports.

Some of these workers operate equipment, such as ice makers, and they are trained on the job to operate the specific machinery and follow safety procedures. Ski lift operators, however, are often skilled millwrights with additional on the job training for ski lift equipment. See the profile for *machinery and transportation equipment mechanics* (731) for details about millwright apprenticeships.

Attendants in *accommodation* and *travel (except airline travel)* usually require at least one or two years of high school, and a high school diploma improves chances for advancement. Bellhops, baggage porters and guest services attendants do not need any specific education but should enjoy working with many different types of people. They must have a neat appearance and a polite and tactful manner. An outgoing personality is an asset. They also need to be physically able to lift and carry luggage. An awareness of safety and security issues is important. They are also trained on the job.

Housekeeping attendants must have enough physical stamina to maintain a rigorous pace of manual labour. They also need to be well-groomed to meet the public and able to work cooperatively with a variety of other employees. They should enjoy routine work. Good communication skills are generally necessary, and knowledge of safety and security issues is important. They are usually trained by more experienced employees.

Working Conditions

Workers in this occupational group can work in different environments, including hotels, cruise ships, and municipal or private recreational and sports facilities. People entering this field should expect some night work, weekend work and irregular hours.

Attendants in *amusement, recreation* and *sport* make up 82% of the entire group. They often spend much of their time outdoors and may work under a variety of weather conditions. Work can be physically tiring, and there can be risks of injury. These workers must show leadership and sensitivity in dealing with people. *Attendants* in *accommodation* and *travel* work mainly inside.

In 1995 the average earnings were $10,800 for attendants in amusement, recreation and sport and $16,000 for attendants in accommodation and travel. The comparable all-occupation average was $27,900. The average earnings for those who worked full time for the whole year ($22,600) was about the same for both groups. The all-occupation average earnings for those who worked full time, full year was $39,400. While these earnings are significantly lower than average, it must be remembered that this is an occupational group where tipping is common and that this additional income may not always be reflected in reported earnings. According to a recent survey of college graduates, those who found work as attendants in accommodation and travel reported average earnings of $1,340 per month, based on 32 hours worked a week. Those who found work as attendants in recreation and sport reported average earnings of $1,170 per month, based on 29 hours worked a week.

This is a medium-sized occupational group in B.C. The level of employment rose 40% from 2,810 workers in 1990 to 3,920 workers in 1998. The majority of the workers are attendants in amusement, recreation and sport, and they account for virtually all of the growth that occurred.

There are very rarely self-employed workers in these occupations.

This occupational group employs a high proportion of part-time workers. Overall, 53% of all of these workers are employed full time, and 47% are employed part time. The respective all-occupation averages are 74% and 26%. This part-time work also tends to be seasonal. While 50% of the attendants in amusement, recreation and sport work part time, 42% are employed part time for part of the year. The attendants in accommodation and travel also have a relatively high proportion of workers employed on a part-time basis (32%), and 25% are employed part time for part of the year. By comparison, only 26% of the workforce is employed part time, and 18% work part time for part of the year. The unemployment rate for attendants in amusement, recreation and sport is higher than the average for all occupations. However, unemployment is less than the average for attendants in accommodation and travel.

Workers are employed mainly in amusement and recreation services (59%). Other employers of these workers include accommodation and food services (12%) and local governments (8%). About 58% of the workers are located in the Lower Mainland, 16% are on Vancouver Island, 19% are in the Okanagan/Kootenay region, and 7% are in Northern B.C.

Women make up 45% of the attendants in amusement, recreation and sport and just 19% of the attendants in accommodation and travel. The B.C. workforce average is 46%. These are occupations that hire young people, particularly for part time and seasonal work. About 40% of the all workers in this occupational group are under 25, which is more than double the provincial average of 15%. The average age is 31.

Employment Prospects

This is a medium-sized occupational group, made up of about 3,920 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment for this group to grow at an annual rate of 2.5%, much faster than the average for all occupations. Despite this high growth in new openings, over two-thirds of the projected openings will be to replace workers who retire. Accordingly, 3,420 positions are projected to become available from 1998 to 2008. Many additional openings will result from worker turnover, a reflection of the relatively low skill requirements, low pay, and often part-time nature of the work. These factors make this occupational group relatively easy to enter.

Most workers in this occupational group are *attendants* in *amusement* and *recreation*. Openings in these occupations account for 84% of the total openings projected to become available for this group. *Other attendants* in *accommodation* and *travel* account for the remaining 16% of the projected openings.

Rapid employment growth in the amusement and recreation services industry and the accommodation and food services industry is the main source of employment growth for these occupations. Together these industries employed over 70% of the workers in these occupations in 1998. Rapidly growing tourism is the main source of employment growth for these industries and consequently for this occupational group as well. For example, Whistler resort community is becoming more of a year-round operation, which in turn is creating employment in these occupations. According to Tourism B.C., nearly twenty-two million overnight visitors who visited B.C. in 1998 spent $8.8 billion, an increase of 3.5% from 1997. The weak Canadian dollar is expected to attract a growing number of U.S. and European tourists to B.C. Canadian travelers will also have an added incentive to travel domestically, and B.C. is a popular tourist destination in Canada. The increase in tourism is largely responsible for the astonishing 28% increase in hotel rooms in the greater Vancouver area from 1996 to 2000. Despite this increase in the number of hotel rooms, industry sources indicate that shortages of rooms exist during peak summer seasons.

Employment growth is also linked to further increases in the B.C. population as more people move to this province. Increased interest in fitness and health and a rising demand for recreational opportunities are also sources of employment growth. There may be employment growth in the gaming industry, including in casinos, and rate of growth will reflect government policy.

Although there is little growth in the number of skiers, there are a growing number of golfers in B.C. This growth stems from an aging population, increased interest in the sport by women and the growing number of golfers who visit B.C. annually. Consequently golf resorts will also be a source of employment growth for these workers.

Overall job growth in local government, which also employs recreation workers, is expected to be slow due to budget constraints.

There will continue to be many opportunities for part time and seasonal work. However, competition will be stiff for full-time career positions. These positions will probably go to those with relevant work experience.

Career advancement is possible with training and experience. Attendants in recreation and sport can become instructors or guides, while attendants in accommodation and travel can move to intermediate positions, such as a hotel front desk clerk. With additional education and training, workers can also advance to supervisory or even management positions.

Related Occupations

attendants in recreation and sport (6670):

- program leaders and instructors in recreation and sport (in 525 athletes, coaches, referees and related occupations)
- supervisors of attendants in recreation and sport (in 621 sales and service supervisors)
- amusement ride operators (in 644 tour and recreational guides and amusement occupations)
- other personal service occupations (in 648 other occupations in personal service)
- other elemental service occupations (in 668 other elemental service occupations)

other attendants in accommodation and travel (except airline travel) (6672):

- other service supervisors (in 621 sales and service supervisors)
- pursers and flight attendants (6432)
- tour and travel guides (in 644 tour and recreational guides and amusement occupations)

Other Elemental Service Occupations

NOC 668

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	6,780	6,230	6,930

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
700	1,430	2,130

Annual Growth 1998-2008 1.1%

Main Industries of Employment	
Personal and Household Services	39%
Hospitals	12%
Accommodation and Food Services	11%

Employment by Region	
Lower Mainland	65%
Vancouver Island	14%
Northern B.C.	8%
Okanagan/Kootenay	13%

Self-employment 8%

Nature of the Work

This occupational group encompasses service occupations involved in garment cleaning and pressing as well as other elemental services.

Dry-cleaning and *laundry machine operators* operate machines to dry-clean or launder garments and household articles. *Dry-cleaning* and *laundry inspectors* and *assemblers* check finished garments to ensure that they meet required standards for cleaning and pressing, and they assemble and bag finished garments. Other workers press garments and household articles using either a hand iron or a pressing machine. All of these workers are employed by dry-cleaning and laundry establishments and by laundries of hotels, hospitals and similar institutions.

This group also includes elemental occupations not elsewhere classified that are concerned with the provision of services and that are employed by a wide range of retail service establishments.

Main Duties

Dry-cleaning and *laundry workers* operate dry-cleaning machines to dry-clean dresses, suits, coats, sweaters, draperies, cushion covers and other garments and household articles. They operate washing machines and dryers to clean shirts, sheets, blankets, towels and other garments and household articles. They operate machines to clean, blow-dry and glaze fur garments, and they operate machines to dry-clean, dye, spray, re-oil, press and re-buff suede and leather garments. They also check finished garments to ensure that they are properly cleaned, dried and pressed. They record damaged or improperly cleaned or laundered garments. They use hand-held steam irons to touch up rough finishes. They assemble and bag finished garments and household articles, and they match invoices with garment tags or garments.

Ironing, pressing and *finishing workers* operate pressing machines to press garments, such as pants, shirts and skirts, as well as household articles, such as sheets and cushion covers. They also fold and bag shirts and sheets and hand iron fine lace or silk garments.

Beauty salon attendants wash, condition and dry customers' hair, assist hairdressers and keep work areas clean. *Door attendants* assist persons entering or leaving hotels, theaters and similar establishments. *Funeral attendants* drive hearses, arrange lights and floral displays, escort mourners, act as pallbearers and clean funeral parlours and chapels. *Laundromat attendants* replenish vending machines, provide change, explain operation of machines to customers, clean the laundromat and arrange for the repair of broken machines. *Parking lot attendants* and *car jockeys* collect parking fees, issue ticket stubs, direct customers to parking spaces and park cars. *Ticket takers* and *ushers* collect admission tickets or passes from patrons at entertainment events and direct patrons to their seats.

Example Titles

dry-cleaning and laundry occupations (6681):

- laundry machine operator
- laundry worker
- dry-cleaner
- assembler, laundry and dry-cleaning
- bagger, laundry and dry-cleaning
- cleaning machine operator
- drapery cleaner
- dyer, laundry and dry-cleaning
- fur cleaner
- inspector
- leather cleaner
- machine operator, laundry and dry-cleaning
- suede cleaner
- spotter
- sprayer, leather or suede

ironing, pressing and finishing occupations (6682):

- laundry finisher
- finisher
- pleats finisher
- presser
- silk finisher
- steam finisher

other elemental service occupations (6683):

- tanning salon attendant
- toll booth attendant
- funeral attendant
- usher
- shoe shiner
- door attendant
- laundromat attendant
- elevator operator
- parking lot attendant
- ticket taker
- car jockey
- beauty salon attendant
- fur storage attendant
- hotel valet
- cloakroom attendant

Education and Training

No specific education is required for occupations in this group. Some secondary school education is generally required, but high school graduates are more likely to be hired. A valid driver's licence is required for some occupations, such as funeral attendant or car jockey.

Dry-cleaners may receive three to six months of on-the-job training, which helps them become familiar with various cleaning processes used for different fabrics and colours and the operation of equipment. Dry-cleaners operate small boilers, but currently there are no regulations regarding the operation and maintenance of this equipment.

Suede, leather and *fur cleaners* may require experience as dry-cleaning or laundry machine operators. Ironing, pressing and finishing occupations usually learn on the job, but familiarity with fabrics is an asset. People who suffer from allergies are not advised to pursue a career in dry-cleaning, but the industry is making efforts to reduce the use of toxic chemicals.

Workers in these occupations need to be able to deal with routine, be methodical and have an eye for detail. Hand-eye coordination is required, especially for ironing and pressing occupations. Basic reading and writing skills are also necessary to match invoice and garments, read labels and make notes about damaged garments.

Funeral attendants who wish to become apprentice embalmers should have a high school diploma. Anyone entering funeral service should enjoy helping people, be emotionally stable and be in good health. Funeral attendants should also be able to communicate with people from a variety of backgrounds, take instructions and carry them out, and dress conservatively and neatly. See the profile for Funeral Directors and Embalmers (6272) for details about an apprenticeship.

Working Conditions

Working conditions in other elemental service occupations vary by establishment and by type of work. Work places for dry-cleaning and laundry occupations, as well as in ironing and finishing occupations, are sometimes congested, poorly lit and poorly ventilated. But more modern facilities are usually better planned and are well-lit and ventilated. Laundries and dry-cleaning establishments are often hot and noisy. Due to the nature of the work and the machinery being used, sewing and pressing areas are usually noisy as well.

Many persons in elemental service occupations do not work a standard work week. Those employed in dry-cleaning and laundry establishments may work evenings and weekend hours.

In 1995 the average annual earnings were $16,900 for those employed in dry-cleaning and laundry occupations, $13,100 for those in ironing, pressing and finishing occupations and $10,700 for those in other elemental occupations, such as ticket takers, hotel valets and attendants in tanning salons, toll booths and beauty salons. These earnings levels are substantially lower than the B.C. all-occupation average of $27,900. These figures reflect both lower than average wage levels and higher than average levels of part-time employment. The average full-time, full-year earnings ($21,800) for these workers was reasonably consistent across the three groups of occupations. This level of earnings is also substantially below the all-occupation average of $39,400. A recent survey of college graduates included those who found work in other elemental service occupations, such as ticket takers, etc. They reported an average earnings level of $1,049 per month, based on 26 hours worked a week.

In British Columbia the number of employed workers in these three groups of occupations decreased by 9%, from 6,780 in 1990 to 6,230 in 1998. About half (48%) of these workers are in dry-cleaning and laundry occupations, 11% are in ironing, pressing and finishing occupations, and 41% are in other elemental service occupations.

Relatively few (less than 8%) of the workers in this entire group are self-employed, compared to the all-occupation average of 15%. For those in the laundry or finishing related occupations, 72% are employed full time, and 27% work part time. The comparable all-occupation averages are 74% and 26%. However, the other elemental service occupations make much higher use of part-time workers. For these occupations, 53% of the workers are employed on a part-time basis, and 41% work part time for part of the year. The unemployment rate for all these workers is about the same as the average for all occupations.

The largest concentration (39%) of workers in this group are employed in personal and household services. Other industries in which they are found include hospitals (12%), accommodation and food services (11%), amusement and recreation services (6%) and other service industries (9%).

The geographic distribution of workers varies somewhat across the three groups of occupations. Those in dry-cleaning and laundry occupations are located in a similar manner to the average for all occupations. About 58% are located in the Lower Mainland, 17% are on Vancouver Island, 17% are in the Okanagan/Kootenay region, and 8% are in Northern B.C. The other two groups of occupations appear to be more specialized and urban-oriented, and as such, they are much more concentrated in the Lower Mainland. About 71% of these workers are located in the Lower Mainland, 12% are on Vancouver Island, 10% are in the Okanagan/Kootenay region, and 7% are in Northern B.C.

Women make up the vast majority of workers in dry-cleaning and laundry (78%) as well as in ironing, pressing and finishing (88%), but their representation is much lower in other elemental services (34%). Overall, women account for 62% of the occupational group as a whole, which compares to 46% for all occupations in B.C.

The age distribution of workers varies across the three groups of occupations. The laundry and finishing occupations have fewer young workers (only 10% under 25) and more mature workers (47% over 45). The respective figures for the all-occupation averages are 15% and 32%. This contrasts with the high proportion of young workers employed in other elemental service occupations (such as parking lot attendants, beauty salon attendants, hotel valets, cloakroom attendants, ushers and tollbooth attendants). About 43% of these workers are under 25. The average age for those in dry-cleaning and laundry occupations is 43, and the average age for those in ironing, pressing and finishing occupations is 40. The high proportion of young workers in other elemental service occupations is reflected in an average age of 33.

Employment Prospects

This is a large occupational group, made up of about 6,230 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment for this group to grow at an annual rate of 1.1%, slower than the average for all occupations. According to this projection, 2,130 positions will become available from 1998 to 2008. About two-thirds of these openings will come from the need to replace workers who leave the labour force, and the remainder will come from growth in the number of new jobs. Many additional openings will result from worker turnover, a reflection of the relatively low skill requirements, low pay and often part-time nature of the work.

Population growth is driving the growth in the number of new jobs for this occupational group. In addition, as the population ages, there will be a higher proportion of elderly members who require the services of these workers. Most new openings for these workers will be in the personal and household services industry, which exhibits an employment growth projection comparable to that of this occupational group.

It is possible for people in dry-cleaning and laundry occupations to progress to supervisory dry-cleaning and laundry positions with additional training or experience. This is also true for people in ironing, pressing and finishing occupations.

Related Occupations

dry-cleaning and laundry occupations (6681):

- dry-cleaning and laundry supervisors (in 621 sales and service supervisors)
- alterers (in 734 upholsterers, tailors, shoe repairers, jewellers and related occupations)
- dry-cleaning service managers (in 01/09 middle and other management)

ironing, pressing and finishing occupations (6682):

- dry-cleaning and laundry supervisors (in 621 sales and service supervisors)

other elemental service occupations (6683):

- attendants in recreation and sport (in 667 other attendants in travel, accommodation and recreation)

Population growth is driving the growth
in the number of new jobs for this occupational group.
In addition, as the population ages,
there will be a higher proportion of elderly members
who require the services of these workers.
Most new openings for these workers will be
in the personal and household services industry.

© Stone/Vancouver

7 - TRADES, TRANSPORT AND EQUIPMENT OPERATORS AND RELATED OCCUPATIONS

Skill Level B - Technical, Paraprofessional and Skilled Occupations

721 Contractors and Supervisors, Trades and Related Workers 428
722 Supervisors, Railway and Motor Transportation Occupations 431
723 Machinists and Related Occupations 433
7241 Electricians (Construction and Maintenance) 435
7242 Industrial Electricians 438
7243 Power System Electricians 439
7244 Electrical Power Line and Cable Workers 441
7245 Telecommunications Line and Cable Workers 443
7246 Telecommunications Installation and Repair Workers 445
7247 Cable Television Service and Maintenance Technicians 447
725 Plumbers, Pipefitters and Gas Fitters 449
726 Metal Forming, Shaping and Erecting Occupations 452
727 Carpenters and Cabinetmakers 455
728 Masonry and Plastering Trades 458
729 Other Construction Trades 462
731 Machinery and Transportation Equipment Mechanics (except Motor Vehicle) 465
732 Motor Vehicle Mechanics 470
733 Other Mechanics 473
734 Upholsterers, Tailors, Shoe Repairers, Jewellers and Related Occupations 477
735 Stationary Engineers and Power Station and System Operators 481
736 Train Crew Operating Occupations 484
7371 Crane Operators 486
7372 Drillers and Blasters - Surface Mining, Quarrying and Construction 489
7382 Commercial Divers 491

Skill Level C - Intermediate Occupations

741 Motor Vehicle and Transit Drivers 494
742 Heavy Equipment Operators 498
743 Other Transport Equipment Operators and Related Workers 501
744 Other Installers, Repairers and Servicers 504
745 Longshore Workers and Material Handlers 508

Skill Level D - Labouring and Elemental Occupations

76 Trades Helpers, Construction, Labourers and Related Occupations 511

Contractors and Supervisors, Trades and Related Workers

NOC 721

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	15,680	17,160	20,590

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
3,430	5,840	9,270

Annual Growth 1998-2008	1.8%
Main Industries of Employment	
Construction	59%
Retail Trade	8%
Metal Fabrication Manufacturing	3%
Employment by Region	
Lower Mainland	56%
Vancouver Island	17%
Northern B.C.	9%
Okanagan/Kootenay	17%
Self-employment	34%

Nature of the Work

In each of the trades, there are senior workers who supervise and coordinate the activities of the tradespeople. This group also includes those trade contractors who run their own businesses. They are employed in a wide range of firms or places of employment, such as construction firms, automotive repair shops and printing establishments.

Positions in this category require demonstrated skills in the particular trade as well as the ability to supervise staff. Because entry into this group is through work experience, interested individuals should read the descriptions of the trades of interest. Some of the trades included in this group are machinists, mechanics, electricians, telecommunications workers and construction workers.

Main Duties

These are senior workers who have mastered the skills of their particular trade. They are able to demonstrate the skills to the workers working under them. The trades they supervise include machinists, electricians, plumbers, welders, carpenters and motor vehicle and heavy equipment mechanics.

Although the responsibilities of those employed in this group will vary by work situation and trade, these workers generally supervise and schedule the activities of other workers. They plan ways to meet work schedules and coordinate work activities. They resolve work problems and recommend ways to improve productivity. They are responsible for hiring, training and promoting workers and for meeting safety standards.

Those who run their own businesses have to estimate costs for projects and manage capital to undertake the work. They must also maintain business records and increasingly be skilled in the use of computers.

Example Titles

- contractor
- crew chief
- foreman/woman
- supervisor

Education and Training

To become a *supervisor* or a *contractor* in a trade, individuals are usually required to have grade 12, plus several years' experience as a qualified tradesperson in that trade. In addition, they require skills in human resource management and business administration. To remain competitive, completion of supervisory and business courses is recommended.

Additional training or experience is often required, depending on the area of work. For instance, in printing and related occupations, completion of a certificate or diploma program in graphic arts technology is recommended. Some trades may require provincial trade certification.

Courses and programs in human resource management, business and related areas are available at all public colleges, university colleges and universities in B.C. Many of these post secondary institutions also have programs or courses in management and leadership skills for supervisors.

A program that involves both construction and business elements is Construction Operations - Statement of Completion offered at the British Columbia Institute of Technology (BCIT). This part-time program is for people who wish to enter the construction industry and those already in the industry who wish to enhance their career potential. Prerequisites include grade 10, with mathematics and English. Students may then choose to take the Construction Supervision - Associate Certificate program.

BCIT also offers a Bachelor of Technology Degree in Construction Management for individuals who wish to participate at the professional level as part of a construction management team. Applicants must already hold a recognized diploma in technology in a related engineering or science discipline or a degree in engineering, architecture, applied science or a related field.

Contractors and supervisors need to be self-motivated, organized and efficient with good decision-making and problem-solving abilities. Oral and written communication skills are necessary, as are good interpersonal skills, leadership qualities and an ability to motivate others. Continual upgrading of knowledge and skills is required.

©Stone/Vancouver

Working Conditions

The working conditions for this occupational group vary as much as the trades themselves. Some are largely indoor trades at industrial sites, while others are outdoor trades at construction sites.

Those who enter their own businesses will need to spend time in an office managing business records. As well as being proficient in the trade, they must develop entrepreneurial skills.

With estimated average earnings of $39,700 in 1995, these workers earned much more than the B.C. workforce average earnings ($27,900). Full-time, full-year workers earned $46,800, also considerably higher than the B.C. workforce average earnings ($39,400).

There is a significant difference between the earnings of men and women in this occupational group. Women earned an annual average of $27,900, compared to $40,200 for men. There are very few women in this occupational group, and they tend to be much younger as they are just entering these occupations and probably have not yet attained many senior positions.

As would be expected, there is a great range in the starting salary for different occupations in this group. According to a recent student outcomes survey, starting salaries for recent college graduates ranged from a low of $2,540 per month for general supervisors to $3,250 per month for mechanic supervisors. According to industry sources, entry-level salaries range from $2,800 to $5,000 per month in the construction trades.

With about 17,160 workers in 1998, this is a very large occupational group. The group grew from 15,680 workers in 1990.

Because the group includes *contractors*, 34% of the workers are self-employed, compared to 26% for the whole workforce. Over 90% of these workers work full time. About 60% work full time, full year.

The unemployment rate for this group is slightly lower than the average unemployment rate for the overall B.C. workforce. However, this occupational group does include a number of construction trades that are subject to periods of booms and busts within the business cycle. Some workers are dependent upon weather conditions as well. Workers can expect periodic layoffs between projects.

The construction industry accounts for 59% of the workers in this occupational group. The remainder work in more specialized trades and are spread out among other industries. For example, retail trade, manufacturing and transportation industries (rail, air and public transit) employ many of these workers. These workers are distributed across the province in about the same proportions as the workforce as a whole. The Lower Mainland is home to 56%, Vancouver Island and the Okanagan/Kootenay region each have 17%, and Northern B.C. has 9% of these workers.

These occupations are dominated by men. Women make up barely 4% of this occupational group. Although more women have entered these trades in recent years, they have yet to attain senior positions in large numbers.

Because these are senior positions, this occupational group has many older workers. The average age for men is 42, and for women it is 37. The average age of workers in the B.C. workforce overall is 38. The 35 to 44 age group makes up the largest share of workers in this occupational group. Younger workers don't have the experience necessary to enter this group, and some of the older workers leave the occupation because of the physical demands or to pursue opportunities in management.

Employment Prospects

This occupational group is projected to grow at a rate that is about as fast as the average for all occupations. About 3,400 new jobs are expected to be created in the next 10 years. In addition, over 5,800 workers are expected to retire. Thus, a total of around 9,300 openings are expected between 1998 and 2008.

The employment opportunities for *trade contractors* or for those in *supervisory positions* will of course depend to a large extent on trends in each industry or in individual trades. Those interested in this work should check with the trade that is of interest for more information. Those entering the trades should also consider self-employment or running their own contracting business as it is a route taken by many qualified and experienced tradespersons.

Construction is the major industry of employment for workers in this occupational group. The construction industry in B.C. grew rapidly from 1986 to 1995. However, between 1996 and 1999 construction activity declined due to weaker population growth, slower economic growth and weaker labour markets. Since then, non-residential construction activity has remained relatively stable, but residential housing construction has dropped from its 1994 peak. Low levels of residential construction have created much pent-up demand for housing. The construction industry is expected to grow at the rate of 1.6% per year between 1998 and 2008, which is the same rate as the provincial average for all industries. Industry sources expect higher than average levels of residential construction and thus increased employment growth over the short term. Repairs to leaky condominiums that were built in the 1980s and 1990s will also create work in the near future for construction workers.

Construction generally is sensitive to factors such as interest rates and material costs. Population growth and an aging population also are factors that directly affect residential construction activity. Seniors staying longer in their homes, divorce and young people expecting to form their own households are part of the changing demographics, and lifestyle changes are affecting both the quantity and mix of housing that buyers can afford or want. Many *contractors* and construction tradespersons rely on this residential building activity to generate business.

The construction industry is recovering from the commercial building boom in the early 1990s. Current shortages of high-end office space will stimulate the market for commercial construction once again. Planning and construction of new hotels has recently started to pick up and is driven by the continued popularity of B.C. as a holiday destination for tourists.

Public sector funding for capital projects has been an important source of construction employment. Since the cancellation of the 1997/1998 public institutional construction freeze, there has been a flurry of school construction. The main focus of construction projects over the short term will be in the transportation infrastructure of the province, which includes road and bridge construction and a planned extension of the Sky Train in the Lower Mainland.

Productivity gains through new materials, processes and other new technologies are reducing the need for tradespeople. As a result, increasing construction activity may not create as many jobs as in previous years.

Because the construction industry employs such a large number of workers, there will be a significant number of openings in the long term, especially to replace an aging workforce. In the short term, there will be considerable competition for positions, and new workers will be competing with experienced workers for the available jobs. However, there may be a shortage of apprentices entering the construction industry over the long term.

Tradespersons who are contractors operating their own businesses are included in this occupational group. These workers need to have business skills. Workers in this occupational group can transfer their skills to related positions or advance to management positions in this and related industries. However, in the construction industry, *supervisors* increasingly need a diploma or degree in construction management or engineering if they expect to advance to project manager, operations manager or general superintendent.

Additional Information

B.C. Ministry of Employment and Investment construction industry profile *http://www.ei.gov.bc.ca/IndustryProfiles/construction/default.htm*

Construction Secretariat *http://www.ei.gov.bc.ca/ConstructionSecretariat/Default.htm*

B.C. Construction Association *http://www.bccassn.com*

Related Occupations

- machinists and related trades (723)
- electricians (7241)
- plumbers and pipefitters (725)
- metal forming, shaping and erecting occupations (726)
- carpenters and cabinetmakers (727)
- masonry and plastering trades (728)
- other construction workers (729)
- machinery and transportation equipment mechanics (731)
- motor vehicle mechanics (732)
- other mechanics (733)
- crane operators (7371)
- drillers and blasters (7372)
- heavy equipment operators (742)
- other transport equipment operators (743)
- other installers, repairers and servicers (744)
- longshore workers and material handlers (745)
- construction managers (in 01/09 middle and other management)
- residential home builders and renovators (in 01/09 middle and other management)
- printing plant, department and production managers (in 01/09 middle and other management)

The construction industry is expected to grow at the rate of 1.6% per year between 1998 and 2008, which is the same rate as the provincial average for all industries. Industry sources expect higher than average levels of residential construction and thus increased employment growth over the short term. Repairs to leaky condominiums that were built in the 1980s and 1990s will also create work in the near future for construction workers.

Supervisors, Railway and Motor Transportation Occupations

NOC 722

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	1,400	1,280	1,520

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
240	600	840

Annual Growth 1998-2008

1.7%

Main Industries of Employment

Rail Transportation	40%
Public Transit and Other Transportation	27%
Truck Transportation	20%

Employment by Region

Lower Mainland	62%
Vancouver Island	14%
Northern B.C.	12%
Okanagan/Kootenay	11%

Self-employment

14%

Nature of the Work

These supervisors work for railways, motor transportation and ground transit companies to supervise and coordinate the work of locomotive engineers, railway workers, commercial truck drivers, bus and delivery drivers, chauffeurs, taxi and limousine drivers and public transit and subway operators. The group includes bus dispatchers as well as some independent truckers who have invested in a truck and hired assistants to help operate it.

This is a position that requires demonstrated skills in the particular trade, as well as the ability to supervise staff. It may also be achieved through investment in equipment, including mechanical tools and facilities to store trucks.

Main Duties

Although the responsibilities will vary by work situation, these workers supervise workers who operate trains, trucks, buses and taxis. These workers generally schedule the activities of other workers. They plan ways to meet work schedules, and they coordinate work activities. They are called upon to resolve work problems and recommend ways to improve productivity. They are responsible for hiring, training and promoting workers and preparing work reports.

All of these occupations involve some record keeping for the workers who are being supervised. In addition to the trade skills, these workers have to have good communication skills to manage those working for them.

Those who operate their own business have to estimate costs for projects, as well as raise and manage the finances to undertake the work. Independent truckers in this category perform the duties of truck drivers (in NOC 741) as well as these supervisory and management tasks.

Example Titles

supervisors, motor transport and other ground transit operators (7222):

- bus inspector
- dispatcher, bus
- foreman/woman, truck fleet
- independent trucker
- subway traffic controller
- supervisor, light rail transit operators
- supervisor, school bus drivers

supervisors, railway transport (7221):

- railway transport operations supervisor
- stationmaster
- trainmaster
- yardmaster

Education and Training

To become a *supervisor in railway and motor transportation occupations*, completion of secondary school followed by several years of experience in the field is usually required. Some post secondary education in an appropriate field is advisable. There is little mobility between occupations in the different transportation sectors. Therefore, it is important to choose the area of specialization early in the training process.

The British Columbia Institute of Technology offers a two-year diploma program in International Trade and Transportation that provides students with broad training in the fundamentals of business and their applications to trade and transport. Prerequisites include grade 12, with English 12 and mathematics 11. Basic keyboard and computer skills are strongly recommended as well. The University of British Columbia offers a Transportation and Logistics option within a four-year bachelor's degree in commerce. Those interested in this program must first complete a pre-commerce year that requires successful completion of specific core courses. Prospective students are advised that competition to the Commerce program is very competitive.

Skills in human resource management and business administration are helpful for those in this field. Courses and programs in these areas are available at all public colleges, university colleges and universities in B.C. Many of these post secondary institutions also have programs or courses in management and leadership skills for supervisors.

Supervisors in rail and motor transport need to be organized and efficient with good decision-making and problem-solving abilities. Oral and written communication skills are necessary. Good interpersonal skills, leadership qualities and an ability to motivate others are also important. To remain competitive, continual upgrading regarding new technology is required.

Working Conditions

Because of the variety within this category, there are a variety of working conditions. Many work in offices but visit directly with work crews.

These workers earned an estimated average of $45,500 in 1995. Those who worked full-time, full-year earned an average of $50,100. The respective all-occupation averages in the province in 1995 were $27,900 and $39,400. However, the earnings for women in these occupations were much lower than those for men. Women earned an average of $29,100, compared to $47,900 for men.

This is a small occupational group, with an estimated 1,280 workers in 1998. This group has experienced a decrease of 120 workers since 1990 when there were 1,400 people employed.

About 14% of these workers are self-employed, and only 8% work part time. The respective all-occupation proportions for self-employment and part-time work are 15% and 26%.

Because these positions are key to the businesses that employ them, these are largely full-time occupations. Over two-thirds of those employed in this occupational group work full time, full year. Approximately 24% work full time for at least part of the year. This group has a lower than average unemployment rate. There is no particular seasonal effect on this occupational group.

The rail transport industry employs 40% of these workers. The other large employers are the public transit commissions (27%) and truck transportation (20%).

The Lower Mainland is home to 62% of this group (compared to 57% of the B.C. workforce), Vancouver Island claims 14%, the Okanagan/Kootenay area has 11%, and Northern B.C. has 12%. However, railway supervisors are non-existent on Vancouver Island, while transportation supervisors have more than their share (21%) compared to the workforce population of Vancouver Island (18%). In addition, railway supervisors are significantly overrepresented in the Okanagan/Kootenay and Northern B.C. regions, at 20% and 26% respectively compared to provincial occupation rates of 15% and 10%.

Women make up 13% of this group. However, 15% are in the transport occupations while only 6% are found in the railway sector.

The average age of these workers is 43, which is five years older than the average age for the overall workforce. These workers are also more concentrated in the middle age groups, with 41% in the 35 to 44 age group and another 26% in the 45 to 54 age group. There are almost no workers in this occupation in the 15 to 24 age group, compared to 15% for the overall workforce. The high proportion of workers in these older age groups reflects the experience required to attain these positions.

Employment Prospects

This is a small occupational group, made up of only about 1,280 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment in this group to grow at an annual rate of 1.7%, about as fast as the average for all occupations. According to this projection, a total of 840 positions will become available from 1998 to 2008. Over two-thirds of these openings will be the result of retirements, and the remainder will come from growth in the number of new positions.

About 60% of the workers in this occupational group are *supervisors of motor transport and other ground transit operators*. Employment in these occupations is projected to grow faster than the average for all occupations. Employment growth for these transportation workers is linked to the adoption, by a growing number of companies, of just-in-time inventory management systems. Companies now rely more heavily on transportation, especially truck firms, to deliver supplies on time. Because urban centres are adopting mass transit systems to alleviate traffic congestion problems, there is also an increasing demand for workers in the transit system.

The remaining workers in this group (about 40%) are *supervisors of railway operations*. Employment of these workers is projected to grow more slowly than the average for all occupations, according to COPS. There is some uncertainty with the employment forecasts for these workers because of the uncertainty in the railway industry. Industry experts expect that there will be a major trend toward North American transcontinental rail systems in next few years, when a U.S. regulatory moratorium on rail company mergers expires in 2002. After the expiry of the moratorium it is expected that railway companies will merge, and these mergers could result in significant staff lay-offs. This downsizing is expected to help increase the efficiency of the industry, reducing the costs of shipping and opening up opportunities for shippers. This may contribute to an increase in the demand for rail transportation over the longer run and consequently may help reverse expected employment losses.

These supervisory positions are achieved through demonstrated skills and experience. Workers interested in these occupations must be willing to update their technical and computer skills because of the increased importance of electronic tracking systems.

Additional Information

Canadian Professional Logistics Institute
http://www.loginstitute.ca

Related Occupations

- truck transport and taxi dispatcher (in 147 recording, scheduling and distributing occupations)
- motor vehicle and transit drivers (741)
- train dispatcher (in 227 transportation officers and controllers)
- contractors and supervisors, trades (721)

This is a position that requires demonstrated skills in the particular trade, as well as the ability to supervise staff.

Machinists and Related Occupations

NOC 723

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	3,110	4,210	4,680

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
470	920	1,390

Annual Growth 1998-2008	1.1%

Main Industries of Employment

Metal Fabrication Manufacturing	48%
Machinery, Except Electrical	12%
Wholesale Trade	5%

Employment by Region

Lower Mainland	67%
Vancouver Island	14%
Northern B.C.	9%
Okanagan/Kootenay	10%

Self-employment	8%

Nature of the Work

Metal products manufacturing companies and machine shops employ these workers to cut or grind metal into parts or products with precise dimensions and features.

Machinists operate a variety of machine tools to make products. *Machining* and *tooling inspectors* examine machined parts to maintain quality control standards. *Tool and die makers* make prototype or special tools, dies, jigs, fixtures and gauges. Apprentices, pattern makers and metal mould makers are included in this occupational group.

Main Duties

Many products use metals in their construction because of the durability of metal under various operating conditions. Parts in these products must meet exacting standards in dimensions, strength and hardness. Although *tool and die makers* work on producing tools and *machinists* make parts for other metal products, their job functions are very similar.

People in these trades read and interpret blueprints. They understand the properties of metal. They rely on this knowledge to set up and operate a variety of machine tools to perform precise machining operations according to project specifications. They fit and assemble machined metal parts and subassemblies.

Because they make parts to exacting standards, they verify the dimensions of products using precision measuring instruments. They calibrate these measuring instruments to ensure accuracy, and they inspect and test completed products to ensure that they meet quality standards.

Tooling inspectors are usually more senior workers who have practised the trade. They check the work of other employees to ensure exacting quality standards are met. These workers are more skilled than the machine operators in manufacturing plants and have more responsibility in setting up projects.

Example Titles

machining and tooling inspectors (7231):

- machining inspector
- machine shop inspector
- machined parts inspector
- tooling inspector

machinists (7231):

- machine tool set-up operator
- apprentice machinist
- machinist
- apprentice automotive machinist
- apprentice diesel engine machinist

tool and die makers (7232):

- apprentice mould maker
- metal mould maker
- apprentice patternmaker
- metal pattern maker
- mould making machinist
- apprentice tool and die maker
- tool and die maker
- jig maker

©Stone/Vancouver

Education and Training

While trade certification is not mandatory for this profession in B.C., *machinists* and *related workers* usually apprentice as a machinist or *tool and die maker*. The Industry Training and Apprenticeship Commission (ITAC) recommends that apprentices complete grade 12, with appropriate English, applied mathematics and science courses.

The term of the machinist apprenticeship is four years, including four sessions of in-school technical training of five weeks each delivered by the British Columbia Institute of Technology (BCIT) for the Province of B.C. Apprentices who have completed approved entry-level training may receive credit toward a portion of the in-school technical training component.

Tool and Die apprenticeships are five years in duration and include four sessions of in-school technical training of five weeks each. Completion of an approved entry-level training program may count as credit toward an apprenticeship. Graduates of the two-year BCIT Tool and Die program, which has a mandatory cooperative education component, may receive even further advanced standing in the apprenticeship. Contact a local ITAC area office for more information on this apprenticeship.

Upon successful completion of in-school and on-the-job training requirements and an interprovincial examination, machinists and tool and die maker apprentices are issued a Certificate of Apprenticeship and a Certificate of Qualification with an interprovincial Red Seal endorsement.

For people who have worked for a long time as machinists but have not completed an apprenticeship, it is possible to be issued a Certificate of Qualification. To be eligible a person must show documented evidence from employers of a minimum of six years' full-time experience in the machinist trade and pass an examination. Local ITAC area offices can provide more information about exam preparation.

Post secondary institutions offer some relevant programs for people who do not want to pursue an apprenticeship. Programs for machinist and tool and die trades are available at BCIT, Selkirk College and College of New Caledonia. Admission generally requires English, mathematics 12 and physics 11 or an equivalent.

Due to recent advances in technology, basic knowledge of computers and electronics is becoming a requirement for these tradespeople. Increasingly, computer controlled machine tools are used. BCIT offers various Computer Numerical Control (CNC) certificate programs designed for journeyed machinists to upgrade their skills in operation and introductory programming of CNC equipment.

Machinists and tool and die makers need mechanical aptitude in order to use tools and machines to build complex parts. They need an ability to estimate and measure accurately and must be able to work independently at tasks where mental concentration is essential. The main physical requirements for these trades include good eyesight and hand-eye coordination, as well as the strength and endurance to lift heavy objects and stand for long periods. Machining workers must have an understanding of the fundamentals of mathematics, metallurgy and mechanical drawing.

Working Conditions

This group combines mental ability with manual skills. To develop a project from blueprints requires careful thought and an understanding of mathematics, as well as good mechanical ability. Increasingly, these workers use computer controlled machines, especially where accurate numerical calculations are essential.

Generally, they work indoors in manufacturing plants or machine shops. In the past, these places were notorious for being noisy and dirty. With more modern equipment, working conditions have improved tremendously. However, most of the work still requires a lot of standing, and workers must be in good physical condition to work with the machinery.

These workers usually enjoy a regular work week. Occasionally there may be some overtime to meet production schedules and some shift work may be required.

The estimated average earnings for this group in 1995 were $37,500, which is well above the workforce average earnings of $27,900. Full-year, full-time workers earned an average of $42,400 a year, which is also above the workforce average of $39,400.

According to a survey of recent college graduates, new entrants to this trade earned an average of $2,460 to $2,640 per month for full-time work. Inspectors earned more than the other workers. The union wage for qualified workers is approximately $4,200 per month.

This is a medium-sized occupational group, with about 4,210 workers in 1998. In 1990 there were 3,110 workers in this occupational group. About 91% of these workers are *machinists* and *inspectors*. *Tool and die makers*, who make up only 9% of these workers, are a very small occupational group.

There is little opportunity for self-employment or part-time employment in this occupational group. Only about 8% of these workers are self-employed, and about 5% work part time. The province-wide average proportions for self-employment and part-time work are 15% and 26%, respectively. On the other hand, over two-thirds (69%) of this group work full time, full year.

This group has an unemployment rate lower than the all-occupation average. Much of their work is on a project-to-project basis, and there may be temporary layoffs between projects. There is no seasonal variation in the workload or the number of employment openings.

The metal fabrication industry, which is by far the largest employer, hires about 48% of these workers. Other heavy industries that have machine shops also employ these workers, as well as various manufacturing and other service industries.

Approximately two-thirds of these workers live in the Lower Mainland, 14% are found on Vancouver Island, 10% are in the Okanagan/Kootenay region, and Northern B.C. is home to about 9%.

This occupational group is dominated by men. Women hold less than 2% of the jobs.

This group has a lower proportion of workers in the 15 to 34 age group than the average for the overall workforce. However, 16% are in the 55 to 64 age group, compared to 9% for the overall workforce. This uneven distribution is reflected in the average age (42), which is higher than that of the entire workforce (38). Industry sources state that the average age of union members is 50, which is even higher than the average for these workers in general.

Employment Prospects

Employment for this medium-sized occupational group of *machinists* and *related occupations* is forecast to grow more slowly than the average for all occupations through to 2008. It is projected that there will be 1,390 openings for this group in the next 10 years. About 470 new jobs will be created because of growth in the economy, and another 920 jobs are expected to become available because of retirements. The larger of the two groups within the machinist occupational group, *machinists* and *inspectors*, will see about 1,230 new and replacement openings to 2008. *Tool and die makers*, the smaller occupation, will have 160 openings by 2008.

The increasing use of sophisticated numerical control systems has transformed, and will continue to transform, the work of machinists and tool and die makers. Technological innovation is increasing the demand for new products and the redesign of old ones. Skilled workers are needed to make these products. The changes require workers who are flexible and who can adapt to the increased use of computerized equipment. Although methods of production will change, knowledge of metals and the principles of metalworking will continue to be the basis for these trades. Workers will adapt their basic skills to a new work environment. Workers can also expect to see the use of new materials in their field, often requiring greater quality control.

Over 70% of machinists and related occupations are employed in the manufacturing industry. According to industry sources, there may be a shortage of qualified machinists over the forecast period, particularly in the Lower Mainland. Industry sources indicate that younger workers are needed to enter the trade to replace those who retire. The age structure of the current workforce in this occupation suggests that there will be job opportunities resulting from a high level of retirements. Unions and management in this industry would like to see younger people enter the trade in order to replace those workers who are close to retirement.

With experience, machinists may become inspectors, and all workers in this group are eligible for promotion to supervisory positions after gaining experience. Red Seal certification in these trades means workers are qualified to work in any of the provinces or territories.

Additional Information

Industry Training and Apprenticeship Commission
http://www.itac.gov.bc.ca

Related Occupations

- machining, metalworking, woodworking and related machine operators (951)
- contractors and supervisors, trades (721)

Electricians (Construction and Maintenance)

NOC 7241

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	5,960	5,510	6,330

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
820	2,360	3,180

Annual Growth 1998-2008	1.4%
Main Industries of Employment	
Construction	74%
Accommodation and Food Services	3%
Education	3%
Employment by Region	
Lower Mainland	59%
Vancouver Island	17%
Northern B.C.	9%
Okanagan/Kootenay	15%
Self-employment	18%

Nature of the Work

Electricians install and repair electrical wiring and related equipment in buildings. Because electricity is used for a variety of purposes including climate control, security and communications, electricians need to be proficient in many applications of electricity. They are employed by electrical contractors, maintenance departments of large institutions, such as hospitals or industrial plants, or they may be self-employed. Electrician apprentices are included in this group.

Main Duties

These electricians work on new construction sites and on renovations to existing buildings. They ensure that all electrical connections are safe and meet the electrical code.

Electricians interpret architectural drawings and electrical code specifications at construction sites. They pull wire through conduits and through holes in walls and floors. They install, replace and repair lighting fixtures and other electrical equipment such as switches, relays and circuit breaker panels. They splice, join and connect wire to fixtures and components to form circuits, according to the plans. As well, they test circuits to ensure the compatibility and safety of systems. In many cases they are called on to troubleshoot faults in electrical and electronic systems as well as to connect sound and visual communication equipment, signalling devices and heating and cooling systems. At some sites, they conduct preventive maintenance programs.

Example Titles

- apprentice electrician
- construction electrician

- electrician
- apprentice community antenna television technician

Education and Training

To work as an *electrician* in B.C. it is compulsory to be certified in the trade or to be registered in a four-year apprenticeship program that will lead to qualification. Electricians must complete the apprenticeship program and pass an interprovincial standards examination to receive a Certificate of Qualification with an interprovincial Red Seal endorsement and a Certificate of Apprenticeship.

While it is not necessary to be certified as an *electrical rewind mechanic*, a four-year apprenticeship program is available for this trade. Electrical rewind mechanics may also receive a Certificate of Apprenticeship and a Certificate of Qualification with an interprovincial Red Seal endorsement upon completion of the program.

As part of the electrician and electrical rewinder mechanic apprenticeship programs, students are required to complete in-school technical training each year in addition to on-the-job experience. Courses are available at B.C. colleges, university colleges and at the British Columbia Institute of Technology (BCIT).

There are several apprenticeships in this area specific to B.C., and those who complete them work for B.C. Hydro. *Telecontrol technology workers* complete a five-year apprenticeship. *Cable splicers* complete a four-year apprenticeship. *Operator/area dispatchers* and *meter technicians* complete a three-and-a-half year apprenticeship. These apprenticeships have work experience requirements but no in-school technical training component.

The Industry Training and Apprenticeship Commission (ITAC) recommends that education required prior to entering these apprenticeship programs is grade 12, with appropriate English, mathematics and science courses.

Many B.C. colleges and university colleges offer entry-level training (pre-employment) programs in a number of these trades that are designed to prepare individuals for employment in electrical or related trades. These programs may also be considered as credit toward some of the required apprentice in-school technical training.

Current details regarding these apprenticeships can be obtained by contacting a local ITAC area office.

Generally, people employed in these areas should have mathematical and mechanical aptitude, an analytical approach to problem-solving, physical strength, manual dexterity, good hand-eye coordination and an ability to work at heights. Additional skills include an ability to read and interpret drawings and electrical code specifications. These workers should be knowledgeable about computerized machinery and efficient with hand tools. Since electrical wires are colour-coded good eyesight and colour vision are vital. These people should be able to work alone or as a member of a team. Those who install or maintain equipment in homes or businesses must be neat and able to deal with customers courteously. To remain competitive in this field workers should be willing to upgrade their skills continually.

Working Conditions

Electricians work in both residential and commercial construction, either as employees or as contractors. As much of their work is done on a project-to-project basis, they are subject to layoffs between projects. The availability of projects is affected by the seasonal nature of the construction industry and by economic conditions that affect construction activity.

Working conditions will vary depending upon the type and stage of the construction project. Rough wiring is done before walls are in place and is weather-dependent. Later in projects, the installation of electrical equipment is done indoors. Much electrical work is done in a standing position, often in confined spaces. Physical risks involved include falling from a height or receiving an electrical shock.

In 1995 the estimated average earnings of these workers ($29,700) were slightly higher than the workforce average ($27,900). However, the average earnings of women were only $22,500. This lower earnings level indicates that a high proportion of women electricians are new entrants to the occupation. Women who worked full time, full year earned $30,200, which is less than the amount earned by the men ($38,000) who worked full time, full year in these occupations. Both of these amounts are below the average earnings for full-time, full-year employees in the workforce ($39,400).

According to the Construction Labour Relations Association of B.C., unionized electricians are paid approximately $34 per hour, as of May 1996. Although this occupation has traditionally been highly unionized, current trends are moving away from union positions. The average salary for recent college graduates entering the trade was $2,560 per month for full-time work.

This occupational group experienced a decline in workers, from 5,960 in 1990 to approximately 5,500 workers in 1998. This occupation is still a large occupational group despite the small decline in workers. The International Brotherhood of Electrical Workers estimates that there are more workers in this group, but the union groups electricians, industrial electricians and power system electricians into the same category.

About 18% of these workers are self-employed. This rate is slightly higher than the 15% rate for the overall B.C. workforce.

Although 90% of these workers consider themselves full-time employees, only 43% work full time, full year. The proportion of full-time, part-year employment in this occupation is higher (46%) than the workforce as a whole (27%). This can be attributed to the seasonal nature of the work.

Electricians tend to have a higher unemployment rate (13%) than the overall provincial workforce because of the cyclical nature of the construction industry. However, women in this occupation have a much lower unemployment rate (8%) than men. Even though these workers have a seasonal pattern of unemployment characteristic of the construction industry, it is not quite as pronounced as in other construction trades. Electricians may find work in the winter months when other construction workers are unemployed.

Almost three-quarters (74%) of these workers work in the construction industry. The remainder are scattered throughout many industries. About 3% work in education.

This is an occupation that occurs in both the rural and the urban areas of the province. These workers are distributed throughout the province in roughly the same proportions as the overall B.C. workforce.

Barely 2% of these workers are women. At an average age of 36, women electricians are younger than their counterparts who are men. The average age of men in this occupation (38) is the same as the workforce average. Close to one-third of these workers are in the 25 to 34 age group, and the remainder are distributed across the age groups in similar proportions to the overall B.C. workforce.

Employment Prospects

Employment in electrical trades is forecast to grow at about the average for all occupations through to 2008. This is a large occupational group with 5,500 workers in 1998. According to the Canadian Occupational Projection System (COPS), about 820 new jobs will be created over this period, and an additional 2,360 replacement jobs will become available as workers retire. This forecast reflects the historic relationship between population growth and construction activity and the generally good level of investment and housing activity.

Construction is the major industry employing workers in this occupational group. The construction industry in B.C. grew rapidly from 1986 to 1995. Between 1996 and 1999, however, construction activity declined due to weaker population growth, slower economic growth and weaker labour markets. Since then, non-residential construction activity has remained relatively stable, but residential housing construction is still below its 1994 peak. Low levels of residential construction since 1995 have created much demand for housing. The construction industry is expected to grow at the rate of 1.6% per year between 1998 and 2008, according to COPS, which is the same rate as the provincial average for all industries. Industry sources expect higher than average levels of residential construction and thus expect higher employment growth over the short term.

Construction generally is sensitive to such factors as interest rates and material costs. Population growth and an aging population also directly affect residential construction activity. Many contractors and construction tradespersons rely on such activity to generate business. Seniors staying longer in their homes, divorce and young people expecting to form their own households are among the demographic and lifestyle changes that are affecting both the quantity and mix of housing buyers can afford or want.

After a boom in the first half of the 1990s, the construction industry remained flat. The commercial construction industry is starting to recover. Current shortages of high-end office space will once again stimulate the market for commercial construction. Planning and construction of new hotels has recently started to pick up and is driven by the continued popularity of B.C. as a holiday destination for tourists.

Public sector funding for capital projects has been an important source of construction employment. Since the lifting of the 1997/1998 public institutional construction freeze, there has been a flurry of school construction. Other public construction projects over the short term will be in the transportation infrastructure of the province and will include road and bridge construction and a planned extension of the Sky Train in the Lower Mainland.

Because the construction industry employs such a large number of workers, there will be a significant number of openings for *electricians* in the long term, especially to replace an aging workforce. Industry sources indicate that there are currently enough apprentices to replace qualified workers who are retiring from the work force. However, there may be a shortage of apprentices over the longer term if employers do not train new entrants to replace older workers who are close to retirement.

Productivity gains are reducing the need for tradespeople. New methods and tools mean that fewer people are required to do the same amount of work. When construction activity does increase, there may not be a corresponding increase in the number of jobs. Because of the essential nature of electrical work, this is not as great a problem for electricians as it is for some other trades. There are also mandatory safety standards that require qualified tradespeople to ensure that connections are made properly.

The nature of the electrician's job is also changing because more electronic equipment is being installed on construction projects. Electricians need to know more about electronics in order to install and maintain the equipment.

Experienced electricians can progress to such supervisory positions as foreman, superintendent, estimator or electrical inspector. With some money and management skills, electricians can start their own contracting businesses.

Additional Information

Industry Training and Apprenticeship Commission
http://www.itac.gov.bc.ca

International Brotherhood of Electrical Workers
http://www.ibew.org

Related Occupations

- electrical mechanics (in 733 other mechanics)
- industrial electricians (7242)
- power system electricians (7243)

- contractors and supervisors, electrical (in 721 contractors and supervisors, trades)

Industrial Electricians

NOC 7242

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	3,320	3,230	3,340

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
110	1,300	1,410

Annual Growth 1998-2008 0.3%

Main Industries of Employment

Construction	26%
Pulp and Paper Manufacturing	13%
Wood Manufacturing	11%

Employment by Region

Lower Mainland	39%
Vancouver Island	21%
Northern B.C.	20%
Okanagan/Kootenay	20%

Self-employment 5%

Nature of the Work

Industrial electricians install, maintain, test, troubleshoot and repair industrial electrical equipment and associated controls on hydraulic and pneumatic equipment. They are employed by electrical contractors and maintenance departments of industrial establishments, such as factories, plants, mines and shipyards. Electrician apprentices are included in this group.

Main Duties

These electricians perform the same duties as construction electricians at industrial sites, except they perform their tasks on larger equipment. *Industrial electricians* interpret architectural drawings and electrical code specifications. They install and repair electrical wiring and electrical components, and they connect wires to fixtures and components to form circuits. As well, they test circuits to ensure the current flows properly and the equipment operates safely. At many sites they maintain, repair, test and install electrical motors, generators, industrial storage batteries and hydraulic and pneumatic electrical control systems. They regularly conduct preventive maintenance programs.

Example Titles

- apprentice electrician
- industrial electrician
- marine electrician
- mill electrician
- mine electrician
- plant electrician
- plant maintenance electrician
- shipyard electrician

Education and Training

In B.C. the *industrial electrician* trade does not have its own apprenticeship and certification program. However, *electricians* are viewed as one trade, and training is provided accordingly. See the profile Electricians (Construction and Maintenance) (NOC 7241) for details.

Working Conditions

Large industrial firms hire *industrial electricians* to install and maintain their electrical equipment and electronic control systems. The workers often work shifts to ensure that the plants operate efficiently 24 hours a day. They may work in factory conditions that are noisy, smelly and dirty. However, control rooms are usually kept clean and can be very pleasant.

Because many industrial sites operate all year, the workload is constant without seasonal adjustments. These workers are more likely to have full-time, full-year work than other electricians (for example, those in construction).

With the increased use of electronic equipment and computers to control industrial operations, these workers are required to know more about computers, as they must have specialized knowledge of the machines that they are maintaining.

The average earnings for these workers in 1995 were $46,600. Those who worked full time, full year earned $53,900. The respective all-occupation averages in the province in 1995 were $27,900 and $39,400. According to a recent graduate survey, the average starting salary for recent college graduates was $3,460 per month for full-time work.

This is a medium-sized occupational group that has experienced a small decline from 1990 (with 3,300 workers) to 1998 (3,200 workers). The growth rate for this group is expected to remain low over the next few years.

Because of the nature of the work, there is very little opportunity for self-employment within this occupation. Self-employed workers constitute about 5% of this occupational group. By comparison, the rate of self-employment across all occupations in B.C. is 15%.

There is also little opportunity for part-time work. About 96% of these workers work full time, and about 65% work full time for the full year. The all-occupation rate for part-time employment in B.C. is 26%. This rate of full-time employment is high because these workers work in large industrial plants that produce at a fairly constant level.

However, the unemployment rate is about the same as the overall B.C average, although not as high as in other trades (for example, construction). Although their workload is not particularly seasonal, they are affected by slowdowns in the economy. Often the slowdowns are caused by international forces beyond the control of the employer. In some cases, such as in shipyards, employees work on a project-to-project basis, and there are layoffs between projects.

These electricians work in a variety of industries, but most work in some aspect of the resources sector, including forestry and mineral manufacturing. The largest single industry employing these workers is the construction industry, which employs about 26% of this group. The pulp and paper industry employs about 13% and wood manufacturing about 11%. The remainder are employed by a number of heavy industries including mining, which employs about 5%.

These workers are distributed unevenly in comparison to the overall population distribution of B.C. There are more workers in rural regions than urban centres. They are employed by large industrial sites such as pulp mills and mines, which are located near the resources they use in the industrial process. The Lower Mainland is home to only 39% of these workers, compared to the overall population distribution of 57%. 21% of these workers are found on Vancouver Island, 20% in the Okanagan/Kootenay region and 14% in Northern B.C.

There are almost no women in this occupational group (less than 1%). By comparison, women hold 46% of the jobs in the overall B.C. workforce.

This group also tends to be older than the workforce as a whole. There are 31% of these workers in the 35 to 44 age group, and another 32% are in the 45 to 54 age group. The average age of these workers is 42, a few years higher than the workforce average of 38.

Employment Prospects

This is a medium-sized occupational group, with 3,200 workers employed in 1998. The Canadian Occupational Projection System (COPS) projects that this occupation will grow more slowly than average. The largest employers for workers in this occupation are in the forestry and mineral product manufacturing industries. These industries are not expected to grow as fast as other parts of the economy. Between 1998 and 2008 only about 110 new jobs are expected to be created due to economic growth. However, because of the older average age of these workers, about 1,300 replacement jobs (over 90% of total openings) are expected to become available as workers retire.

The nature of this job is changing as electronic equipment is increasingly being used to control processes in industrial plants. Electricians will need to know more about electronics to install and maintain equipment. Increased automation may also mean that some employment will shift to electronic and instrumentation technical fields.

Industrial electricians have the same formal trades training and qualifications as other electricians. The same union represents all types of electricians and will assist qualified union tradespeople in finding employment. Note that some employment in industrial plants is non-union.

Electricians who work in mills require some skills that are not commonly used by other electricians. Industrial electricians can transfer some of their skills to other electrician positions. Workers can advance to supervisory positions or can become self-employed or operate their own businesses.

Additional Information

Industry Training and Apprenticeship Commission
http://www.itac.gov.bc.ca

International Brotherhood of Electrical Workers
http://www.ibew.org

Related Occupations

- power system electricians (7243)
- electricians (construction and maintenance) (7241)
- contractors and supervisors, trades (721)

Power System Electricians

NOC 7243

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	190	270	270

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
0	100	100

Annual Growth 1998-2008

Main Industries of Employment

Electric Power Utilities	86%
Construction	5%
Local and Other Administration	5%

Employment by Region

Lower Mainland	45%
Vancouver Island	17%
Northern B.C.	13%
Okanagan/Kootenay	23%

Self-employment 0%

Nature of the Work

Power system electricians install and repair electrical power distribution system equipment used in the generation and transmission of power to consumers. That is, they service the equipment that generates and regulates electricity, rather than the transmission lines that transport it. They are employed by electric power generation, transmission and distribution companies. Apprentices are included in this group.

Main Duties

Power system electricians install and maintain high voltage electrical power distribution equipment, including generators and transformers in generating stations or powerhouses. They inspect and test installed electrical equipment at power houses and major substations. They repair or replace faulty electrical equipment and complete test and maintenance reports.

Example Titles

- apprentice electrician
- power electrician

- power station electrician
- power system electrician

Education and Training

In B.C. the *power system electrician* trade does not have its own apprenticeship and certification program. However, *electricians* are viewed as one trade and training is provided accordingly. See the profile Electricians (Construction and Maintenance) (NOC 7241) for details.

Working Conditions

This is a very specialized occupation with very few employers in the province. B.C. Hydro is the main employer.

Hydroelectric power in B.C. is generated at major dams throughout the province and distributed to consumers through the provincial power grid of transmission lines and substations. The largest dams exist on the Columbia and Peace River systems. At Kemano, Alcan Aluminium created a power station by diverting the headwaters of the Nechako River through a tunnel in the Coast Mountains.

These *electricians* may work in remote areas installing new power stations, or work in adverse weather conditions repairing storm-damaged substations. They are often required to work at heights and must be careful around high voltage equipment.

Those who work in power stations do so in pleasant surroundings, usually at dam sites removed from urban areas. They must be knowledgeable about specialized electrical equipment and controls.

In 1995 these workers earned an average of $47,800, which is well above the workforce average of $27,900. Those who worked full time, full year earned $ 51,100, also well above the $39,400 average for all full-time, full-year workers in B.C.

This is a very small occupational group with about 270 workers in 1998. In 1990 there were 190 workers. By its nature, this occupation is not suited for self-employment (0%) or part-time employment (0%). By comparison, the B.C. all-occupation averages for self-employment and part-time work are 15% and 26%, respectively.

About 80% of these workers work full time, full year, and 20% work full time for at least part of the year. The full-time, full-year figure for this occupation is well above the average for the overall workforce (47%). The unemployment rate is higher than the overall workforce average.

More than three-quarters (86%) of these workers work for electrical power companies. Construction companies employ an additional 5%, and the remaining positions are found in administration and the telecommunications industry.

A higher than average share (23%) of these workers live in the Okanagan/Kootenay region. Another 13% live in Northern B.C. and 17% on Vancouver Island. Less than half (45%) of these workers live in the Lower Mainland, compared to 57% of the total workforce.

This occupational group is dominated by men. Only 3% of the work is held by women. This occupation appears to have been a recent career choice for women, as 100% fall within the 25 to 34 age range. The average annual earnings for women in this group are $30,000, slightly higher than the workforce average but well below the average for men in this occupation ($48,700).

With an average age of 43, these workers are five years older than the workforce average. Of these workers, 37% are in the 35 to 44 age group, and 33% are in the 45 to 54 age group, significantly higher than the respective percentages for the overall workforce. All of the older age groups are overrepresented in this occupational group compared to the distribution of age groups in the workforce as a whole.

Employment Prospects

According to the Canadian Occupational Projection System (COPS), this occupational group will see little change in employment. This is a very small occupational group of only 270 workers in 1998, and it is anticipated that no net new positions will be created between 1998 and 2008. About 100 replacement positions are, however, expected to become available because of people retiring. These replacement positions will provide the best opportunities for people interested in working in this field.

There are many factors contributing to the weak employment growth forecast for this occupation. Power companies such as B.C. Hydro are no longer building large hydroelectric dams. This is partly due to environmental concerns and partly due to conservation. Consumers' energy usage has slowed because of conservation measures, and the provincial power grid is being supplemented by the cogeneration of power with industrial plants.

At present about 90% of the electricity provided by B.C. Hydro is generated by hydro power, with the balance coming from wood waste, natural gas and diesel. Despite the success of customer energy efficiency programs, electricity demand continues to grow in British Columbia, partly because of growing population. B.C. Hydro has indicated that B.C. has enough resources to meet projected electricity demand for at least the next five to seven years. By 2007, however, B.C. Hydro will need to acquire new resources in order to meet customers' needs. Gas is expected to be used to generate electricity to meet most of this demand, complemented by other environmentally friendly energy resources.

Power system electricians work primarily in coal fired plants that are steam generating, such as those found in Alberta and other areas of North America. There are very few plants of this nature in B.C., and this fact is reflected in the very small number of these workers here.

Electricians who work in this field have the same formal trades training and qualifications as other electricians. Most have a combination of electrician and power line and cable technician training, and they can transfer some of their skills to other electrician positions. With experience, workers can advance to supervisory positions or can use their trade qualifications to become self-employed or to start their own businesses as construction electricians.

Additional Information

Industry Training and Apprenticeship Commission
http://www.itac.gov.bc.ca

International Brotherhood of Electrical Workers
http://www.ibew.org

Related Occupations

- electrical mechanics (in 733 other mechanics)
- electricians (construction and maintenance) (7241)
- industrial electricians (7242)

Electrical Power Line and Cable Workers

NOC 7244

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	750	1,000	1,000

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
0	390	390

Annual Growth 1998-2008

Main Industries of Employment

Electric Power Utilities	72%
Construction	18%
Public Transit and Other Transportation	3%

Employment by Region

Lower Mainland	43%
Vancouver Island	20%
Northern B.C.	13%
Okanagan/Kootenay	24%

Self-employment 3%

Nature of the Work

Hydroelectric power is distributed through the provincial power grid to consumers via overhead transmission lines and underground cables.

Electrical power line and *cable workers* construct, maintain and repair overhead and underground electrical power transmission and distribution systems. They are employed by electric power companies, electrical contractors and public utility commissions. Apprentices are included in this group.

Main Duties

These workers install and maintain electrical distribution and transmission systems. This involves erecting and maintaining steel, wood and concrete poles, towers and guy wires, and splicing, soldering and insulating conductors and related wiring to connect power distribution and transmission networks. They inspect and test overhead and underground power lines and auxiliary equipment. As well, they install and maintain street lighting systems. Because of the high voltages in transmission lines, they must adhere to safety practices and procedures.

Example Titles

- apprentice cable splicer
- apprentice powerline technician
- cable installer, electrical power
- cable splicer, electrical power
- construction lineman/woman, electrical power line
- power line patroller
- power lineman/woman

Education and Training

To work as a *power line technician* in B.C., it is compulsory to be certified in the trade or to be registered in a three-and-a-half-year apprenticeship that will lead to qualification. Recommended education for this apprenticeship is grade 12 or equivalent, including appropriate English, applied mathematics and science courses.

In addition to on-the-job work experience, apprentice power line technicians must undertake 16 weeks of in-school technical training each year. Electronics training is available at colleges and university colleges in the province and at the British Columbia Institute of Technology (BCIT). Completion of an entry-level training program may confer credit toward some of the required technical training. Upon completion of the apprenticeship, power line technicians must pass an interprovincial standards examination to receive a Certificate of Apprenticeship and a Certificate of Qualification with an interprovincial Red Seal endorsement. Current details regarding this apprenticeship can be obtained by contacting a local apprenticeship office.

Generally, people employed as power line technicians should have mathematical and mechanical aptitude, an analytical approach to problem solving, physical strength, manual dexterity, good hand-eye coordination and an ability to work at heights. Additional skills include an ability to read and interpret drawings and electrical code specifications and to install, replace and repair equipment. These workers should be knowledgeable about computerized machinery and efficient with hand tools. Since electrical wires are colour-coded, good eyesight and colour vision are vital. To remain competitive, power line technicians should be willing to upgrade their skills continually.

Working Conditions

Line workers erect high-voltage transmission lines leading from electricity generating sites to consumers. These power line workers move from project to project, often changing provinces and working in remote areas. Transmission line construction is contractual by nature and is usually only a part of a major project involving a generating facility. As a result, construction line workers may be unemployed between projects.

Usually these workers work a 35 to 40 hour week but may work for long periods during emergency conditions, such as major storms. Repair and service line workers are usually on call.

These workers often climb ladders or operate hydraulic buckets when working aloft on poles and towers. They may work in confined spaces, such as trenches and tunnels, to install underground power lines and associated equipment.

On average, these workers earned an estimated $50,700 a year in 1995, which is well above the provincial workforce average of $27,900. Those who worked full time, full year earned $57,000, which is also well above the B.C. workforce average of $39,400.

This is a small occupational group, with about 1,000 workers in 1998. This is up from 750 workers in 1990. Because these workers generally work for major utilities, there are few opportunities for self-employment or part-time work. About 3% of these workers are self-employed, and 4% work part time. By comparison, the proportions of self-employment and part-time work in the overall workforce are 15% and 26%, respectively.

About 96% of these workers are employed full time, and 72% work full time for the full year. The unemployment rate for this group is slightly higher than the provincial average, as there is some seasonal work during the construction phases.

The electric power industry employs almost three-quarters of these workers (72%). The only other industry to employ a significant share of them is the construction industry.

Many of these workers live in the Lower Mainland (43%), while 24% live in the Okanagan/Kootenay region, which is much greater than the average for the overall B.C. workforce. On the other hand, only about 6% live in the urban centre of Victoria, which is less than the average for the workforce as a whole.

This occupational group is dominated by men, with only about 10 women workers (less than 1%) in the whole province.

The average age of all workers in this group is 43, which is slightly older than the average age for the general workforce (38). Over a third of these workers are in the 45 to 54 age group. There is also a high proportion of these workers between the ages of 55 to 64.

Employment Prospects

It is expected that there will be little change in employment in this occupational group. About 390 replacement positions are expected to become available between 1998 and 2008 as older workers retire.

There are many factors contributing to the weak employment growth forecast for these occupations. Power companies such as B.C.Hydro are no longer building large hydroelectric dams, partly due to environmental concerns. It is the large hydro projects that require large work crews, including *electrical power line* and *cable workers*, to construct new, long distance transmission lines. Individual consumers' energy usage has slowed because of conservation measures and more efficient appliances. The provincial power grid is also being supplemented by the cogeneration of power with industrial plants.

At present about 90% of the electricity provided by B.C. Hydro is generated by hydro power, with the balance coming from wood waste, natural gas and diesel. Despite the success of customer energy efficiency programs, electricity demand continues to grow in British Columbia because of growing population, increased industrial demand and growing export markets. B.C. Hydro has enough resources to meet projected electricity demand for at least the next five to seven years. By 2007, however, B.C. Hydro estimates that it will need to acquire new resources in order to meet customers' needs.

Electrical power line and *cable workers* are highly mobile, and their skills are in demand across Canada and in the United States. Reductions in this occupation over the past ten years, combined with an aging workforce, have resulted in a shortage of cable splicers and power line technicians across North America. Currently B.C. is experiencing a shortage of cable splicers and will soon have a shortage of power line technicians. Well trained and experienced workers from B.C. are currently being recruited to perform supervisory duties on projects in Florida and California. Only some of these workers will return to the province. The industry is preparing for future retirements by training new apprentices in sufficient numbers to meet future demand.

Additional Information

Industry Training and Apprenticeship Commission
http://www.itac.gov.bc.ca

International Brotherhood of Electrical Workers
http://www.ibew.org

Related Occupations

- power system electricians (7243)
- telecommunications line and cable workers (7245)

These workers install and maintain electrical distribution and transmission systems. This involves erecting and maintaining steel, wood and concrete poles, towers and guy wires, and splicing, soldering and insulating conductors and related wiring to connect power distribution and transmission networks.

Telecommunications Line and Cable Workers

NOC 7245

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	1,310	1,310	1,310

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
0	510	510

Annual Growth 1998-2008

Main Industries of Employment

Telecommunication Carriers	65%
Radio and TV Communications	16%
Construction	10%

Employment by Region

Lower Mainland	58%
Vancouver Island	14%
Northern B.C.	8%
Okanagan/Kootenay	20%

Self-employment	3%

Nature of the Work

Telecommunications line and *cable workers* install and repair telecommunication lines and cables. They are employed by cable television companies, telephone companies and other telecommunications services.

Main Duties

Virtually every house contains a telephone and cable line to provide a hook-up to these services. The workers in this category install and repair the telephone and other telecommunication transmission lines needed to gain access to these services. They install cable television lines and cables, as well as splice and repair various types and sizes of telephone and telecommunication cables. Further, they inspect and test telecommunication transmission lines and cables, and they analyse and record test results.

Example Titles

- apprentice lineman/woman, telecommunications
- apprentice cable splitter
- cable repairer, telecommunications
- communication technician, construction
- construction technician, CATV
- lineman/woman, telecommunications
- splicer technician, telephone
- telecommunications line installer
- telephone line technician

Education and Training

Telecommunications line and *cable workers* require completion of grade 12 and usually at least an electronics diploma program. Related experience is a strong asset, and a driver's licence is usually required.

Admission into most electronics programs requires prior completion of a provincial government approved Electronics Common Core program offered by many colleges, university colleges and the British Columbia Institute of Technology (BCIT). Admission generally requires completion of grade 12, with appropriate English, math and science courses.

Building on the foundation of this common core, students are eligible to take several electronics programs offered throughout the province. For instance, BCIT, Camosun College, College of New Caledonia and Okanagan University College all offer Electronic Engineering Technology diploma programs. BCIT offers this program with a specialization in Telecommunications Technology.

For career advancement, graduates of electronics engineering technology programs who complete an additional six months in the Electronics Engineering Bridging Program at Camosun College may transfer directly into third year of the Electrical and Computer Engineering bachelor's degree program at the University of Victoria. Transferring credits to other universities is possible but only on a course by course basis.

BCIT and the University College of the Cariboo both offer a Telecommunications Technician diploma program that also builds on the generic technical skills developed in the Electronics Common Core program. These trade programs focus on the installation, maintenance and repair of telecommunication equipment.

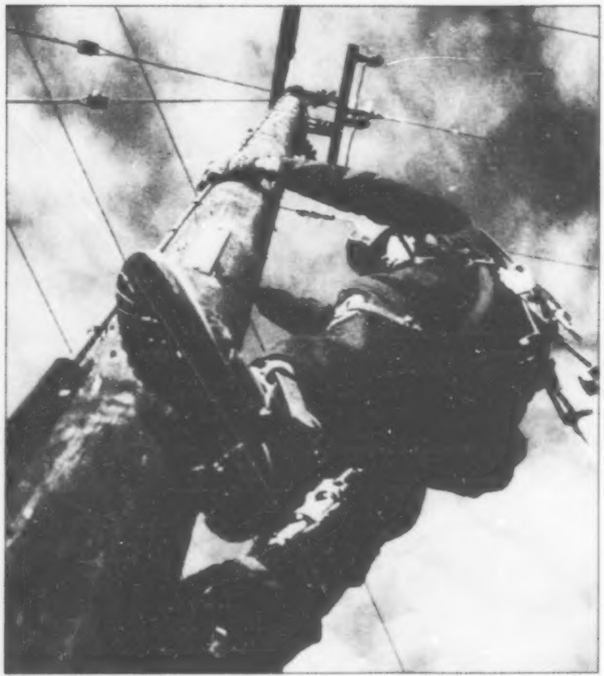
Professional accreditation is available through the Applied Science Technologists and Technicians of British Columbia (ASTTBC). The ASTTBC recognizes individuals who complete certain educational requirements and practical employment experience in telecommunications and in similar fields. Accredited electronics engineering or electronics technology programs are offered through BCIT, Camosun College, Kwantlen University College and Okanagan University College.

This type of work requires some mechanical aptitude. An ability to follow instructions and perform detailed work is important as is a strong background in mathematics and science. Computer skills may be an asset, and good interpersonal skills are needed. Physical fitness and mobility are generally necessary.

Working Conditions

Because these workers install the main transmission lines, they work mainly outdoors. They face working in inclement weather, particularly in cases of storm damage to transmission facilities. These workers generally work regular hours, but they may be on call 24 hours a day for emergency repairs. Emergencies usually occur in poor weather conditions and can result in long hours for these workers.

In 1995 these workers earned an average of $44,300 per year, which is well above the workforce average of $27,900. Those who worked full time, full year earned $47,700, also well above the workforce average of $39,400.



©Stone/Vancouver

There is a small difference in earnings between men and women workers. Women workers earned an average of $44,900 for full-time, full-year work compared to $47,800 for men. This has traditionally been an occupation dominated by men, with some (4%) women workers. Those women who have gained work in this occupation are slightly younger (38) on average than the men (40).

This is a small occupational group, with 1,310 workers in 1998. This occupation has not grown since 1990, when there were also 1,310 workers, and it is not projected to grow in the near future. It is estimated that the only openings in this occupation until 2008 will come from attrition and retirement.

Because the telecommunication lines are controlled by larger companies, such as telephone and cable companies, there is very little opportunity for self-employment in these occupations. Barely 3% of these workers are self-employed, and less than 4% work part time. By comparison, 15% of workers in the overall B.C. workforce are self-employed, and 26% are employed part time. Over 96% of this occupational group work full time, and 77% work full time all year round.

The unemployment rate for this group is extremely low. The demand for services in these occupations tends to be constant throughout the year, especially in the communications industry. Workers in the construction industry may encounter seasonal and cyclical unemployment.

Telecommunications carriers employ 65% of these workers. Radio and television communications industries employ 16%, and the construction industry employs another 10% of this group. The remaining workers are spread among various industries and services.

These workers live in all parts of the province. They are distributed roughly in the same proportions as the workforce overall.

In this occupation over 96% of the workers are men. Women are slowly entering the field, but their representation is still very low.

A significant number of these workers (42%) are in the 35 to 44 age group, and 30% are in the 45 to 54 age group. Only about 7% of the workers are in the 15 to 24 age group.

Employment Prospects

The telecommunications industry is changing rapidly. Deregulation of telecommunications service providers and advances in sophisticated telecommunications systems, such as fibre optics, improved computer technology and the Internet, have stimulated growth in this industry. Communications lines are carrying not only analogue voice transmissions (audio waves that people can hear) and analogue data (such as facsimile transmissions) but also digital signals on fibre optic cables and coaxial cables that have increased the capacity for data transmission enormously. The largest growth area in the telecommunications industry is in mobile telecommunications, cellular technology and the Internet. Much of the research in telecommunications technology in the future will be in wireless technology, which will ultimately reduce telecommunications dependency on the telecommunication line and cable infrastructure in future.

While the telecommunications industry was previously controlled by a few companies, deregulation has increased the number of telecommunications providers and reduced the cost to users. This has led to major growth in both the number of services and the number of users.

Since overall industry growth is expected to be led by expansions in the wireless technologies, there is little employment growth expected between 1998 and 2008 for *telecommunications line* and *cable workers*, according to the Canadian Occupational Projection System (COPS). About 510 positions are expected to become vacant because of retirements. Industry sources suggest that even this projection is too optimistic and that there will more probably be a net reduction of workers in this field over the next few years. Currently many companies are downsizing in these occupations, and the current job market is bleak.

The risk that companies face in downsizing too much is that they may lose the older, highly skilled workers they need to maintain quality service. Emergencies, such as harsh weather, can then put a strain on systems if staff must be brought in from other areas.

Companies will rely more heavily on graduates of colleges and technical institutes who are highly trained in the skills required to do the job. Particularly for new workers, contract work may become more prevalent as many new companies coming into the industry contract for selected services in areas where they do not maintain a permanent work force.

With the rapid changes in technology, workers in this occupational group will require periodic retraining or skills upgrading. The skills acquired can also be transferred to other positions in the telecommunications industry, because the distinctions between trades in the industry are not as clear as they used to be. In addition, a wider range of telecommunications carriers need many of the skills that were formerly limited to a single telecommunications carrier, such as the telephone company. As they gain experience, workers in this group can advance to supervisory positions.

Additional Information

Industry Training and Apprenticeship Commission
http://www.itac.gov.bc.ca

Applied Science Technologists and Technicians of B.C.
http://www.asttbc.org

Communications, Energy and Paperworkers Union of Canada (CEP) http://www.cep.ca

Telecommunications Workers Union
http://www.twu-canada.ca

Related Occupations

- telecommunication installation and repair workers (7246)
- cable television service and maintenance technicians (7247)

Telecommunications Installation and Repair Workers

NOC 7246

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	3,700	3,320	3,320

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
0	1,290	1,290

Annual Growth 1998-2008

Main Industries of Employment

Telecommunication Carriers	77%
Construction	7%
Wholesale Trade	5%

Employment by Region

Lower Mainland	65%
Vancouver Island	15%
Northern B.C.	7%
Okanagan/Kootenay	13%

Self-employment	3%

Nature of the Work

Telecommunications installation and *repair workers* install and repair telephones, telephone switching equipment or other telecommunications equipment. They are employed by telephone, telegraph and other telecommunications transmission services firms.

Main Duties

Telecommunications involve directing an electronic signal from a sender to a receiver. The message is relayed through several exchanges, including communications satellites, before it reaches the receiver. These workers ensure that the equipment used to relay the signals is in place and in proper working order.

Telecommunications installation and *repair workers* install and maintain various telecommunications equipment. All workers inspect and test the equipment they work with. *Telephone installers* specialize in telephone equipment, wiring and associated hardware. *Service testers* specialize in testing, diagnosing and managing the repair of equipment. *Telecommunications equipment technicians* install and maintain equipment, such as telex and facsimile machines, teletypewriters, mobile radios and cellular telephones.

Example Titles

- apprentice electronics communication technician
- apprentice telecontrol technologist
- central office technician
- communication technician
- telephone exchange tester
- cellular telephone technician
- line and station installer, telephone
- mobile radio installer
- private branch exchange (PBX) installer
- switch network installer and repairer
- telecommunications equipment technician
- telephone installer

Education and Training

Completion of secondary school plus a relevant post secondary education program in electronics are generally required to work in this field. Employers usually provide on-the-job training for specific equipment and operations.

In B.C. *telecommunications installation* and *repair workers* must complete the same educational programs as do telecommunications line and cable workers. See the profile Telecommunications Line and Cable Workers (NOC 7245) for details.

Working Conditions

These workers install equipment in buildings and telephone exchanges. Consequently they work largely indoors. Much of their work consists of upgrading wiring in existing buildings. Many new buildings are prewired for electronic equipment. Generally, they work daytime, weekday hours, though some may be on call around the clock.

These workers earn salaries well above the average for the overall B.C. workforce. The average earnings in 1995 for all workers in this occupation were $44,900, while those who worked full time, full year earned an average of $47,800. The small difference in these two figures reflects the high level of full-year employment these workers experienced. The respective all-occupation averages in the province in 1995 were $27,900 and $39,400. According to a recent graduate survey, college graduates starting at entry-level positions in this occupation earned an average of $2,650 per month ($31,800 per year) for full-time work.

This is a medium-sized occupational group. In 1990 there were about 3,700 workers. Since then, the number of workers has declined to 3,300 in 1998.

These workers depend mainly on a single industry, and there is little opportunity for self-employment or part-time work. Only about 3% of these workers are self-employed, and another 3% are part-time employees. By comparison, the proportions of self-employment and part-time work in the overall workforce are 15% and 26% respectively. However, there are many opportunities for full-time employment. A full 80% of workers in this occupation work full time, full year, and an overwhelming 97% work full time at least part of the year. The overall average for the workforce as a whole for full-time, full-year work is 47%.

Unemployment is also uncommon in this occupational group. The unemployment rate is lower than that for the provincial workforce. Employment in the telecommunications industry tends to be steady, with little seasonal or cyclical variation. However, workers in the construction industry often experience seasonal and cyclical unemployment.

The telecommunications industry employs about 77% of this group. An additional 7% work in the construction industry, and about 5% work in the wholesale trade. The remaining workers are spread throughout various business and service industries.

These workers live in all parts of the province in roughly the same proportions as the workforce overall. A slightly higher proportion than average live in Vancouver, as many of the larger offices that rely on telecommunication systems to carry out their business are located there.

Although barely 8% of these workers are women, the number has been growing, and their average earnings, while slightly lower than that of their counterparts who are men, are much higher than the overall average for women in the workforce. Women in this occupation are on average 37 years of age. The majority of women are clustered into two age groups. Close to half (46%) are in the 35 to 44 age group, and an additional 29% are in the 25 to 34 age group. Men in this occupation tend to be slightly older, with an average age of 43.

Taking the average ages of men and women together, there are more older workers in this occupational group than the average for all occupations. About 34% of these workers are in the 35 to 44 age group, and an additional 34% are in the 45 to 54 age group. In comparison, the 35 to 44 age group constitutes 28% of the workforce as a whole, and the 45 to 54 age group constitutes 21% of the workforce. Only 3% of these workers are in the 15 to 24 age group, compared to 15% for the overall workforce.

Employment Prospects

Technology is changing rapidly in this field with the development of fibre optics and improved computer technology. The companies providing telecommunication services expect that many new technologies and services will be offered in the near future. They predict that the industry will be very different in 10 years but are unable to predict exactly what the differences will be. For example, home access to the Internet is expected to become much more popular, and both telephone providers and cable television companies hope to capture this new business. B.C. is leading Canada in accessing new technologies. In 1999, 48% of households in B.C. had regular Internet users from any location and 36% used the Internet at home, which were the highest rates in Canada.

Despite the good outlook for the telecommunications industry, the prospects for *telecommunications installation* and *repair workers* are not good. Projections from the Canadian Occupational Projection System (COPS) indicate that there will be little change in their number between 1998 and 2008. This medium-sized occupational group employed 3,300 workers in 1998. COPS does, however, expect that about 1,290 replacement positions will become available from workers retiring. Industry sources suggest that this projection is too optimistic and that there will more probably be a reduction of workers in this field over the next few years, and therefore the number of openings from those retiring will be fewer than projected by COPS. Currently companies are laying off workers in this occupation, and the immediate job market is bleak. While the number of telecommunications services that will be provided is expected to flourish, fewer workers will be required to provide them because of advances in technology. For example, components and digital circuitry have reduced the workload for installers. Other technological advances mean that telecommunications installation work is no longer restricted to specialized telecommunications employees but may be performed by construction electricians while building and renovating homes and offices.

While the telecommunications industry was previously controlled by a few companies, deregulation has increased the number of telecommunications providers and reduced the cost to users. This has led to major growth in both the number of services and the number of users but not in the number of telecommunications workers required to provide the services. Presently, telecommunications companies are restructuring and downsizing.

The risk that companies face in downsizing too much is that a company can lose the older, highly skilled workers it needs to maintain quality service. Emergencies, such as harsh weather, can put a strain on systems if staff must be brought in from other areas.

Companies will rely more heavily on graduates of colleges and technical institutes who are highly trained in the skills required to do the job. Particularly for new workers, contract work will become more prevalent, as many new companies coming into the industry contract for selected services in areas where they do not maintain a permanent work force.

With the rapid changes in technology, workers in this occupational group will require periodic retraining or skills upgrading. The skills acquired can also be transferred to other positions in the telecommunications industry, because the distinctions between trades in the industry are not as clear as they used to be. In addition, a wider range of telecommunications carriers need the same skills that were formerly limited to a single telecommunications carrier, such as the telephone company. As they gain experience, workers in this group can also advance to supervisory positions.

Additional Information

Industry Training and Apprenticeship Commission
http://www.itac.gov.bc.ca

Applied Science Technologists and Technicians of B.C.
http://www.asttbc.org

Communications, Energy and Paperworkers Union of Canada (CEP) http://www.cep.ca

Telecommunications Workers Union
http://www.twu-canada.ca

Related Occupations

- telecommunications line and cable workers (7245)

Cable Television Service and Maintenance Technicians

NOC 7247

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	590	740	810

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
70	310	380

Annual Growth 1998-2008

0.9%

Main Industries of Employment

Radio and TV Communications	80%
Construction	10%
Telecommunication Carriers	2%

Employment by Region

Lower Mainland	49%
Vancouver Island	19%
Northern B.C.	7%
Okanagan/Kootenay	24%

Self-employment

5%

Nature of the Work

Cable television service technicians install, maintain and repair cable television signal and associated equipment, including equipment in homes and commercial buildings. *Cable television maintenance technicians* maintain and repair cable television and transmission and distribution systems and associated hardware. They are employed by cable television companies. This is a very small occupational group.

Main Duties

Most television owners subscribe to a cable service to enhance their picture quality and to have access to a greater number of channels. Cable companies unscramble TV signals from communications satellites and redistribute them via cables to subscribers' sets. They also provide high speed connections via cable to private homes and businesses for accessing the Internet and communicating with other computers using FTP software. Computer owners now have the choice of using either a telephone connection or a higher speed cable connection to access the Internet and other computers.

These technicians install and maintain the equipment and cables necessary to accept satellite TV signals or Internet signals and redistribute them to individual users. They connect, disconnect and relocate cable hardware and systems on subscribers' premises. They ensure that the subscriber receives the services required. They inspect, test and repair the cable television or computer modem equipment used to redistribute the signals. They also maintain and repair main cable television transmission lines and related distribution systems, as well as inspect, monitor, test and adjust cable transmission and distribution systems. As needed, they repair or replace faulty cables and associated transmission and distribution equipment. Some workers are employed in the construction industry, pre-wiring new buildings.

Example Titles

- apprentice community antenna television technician
- cable television servicer
- CATV technician
- installation technician, cable television
- maintenance technician, cable television
- television installer

Education and Training

While it is not necessary for workers in this field to be certified, apprenticeship programs are available in order to gain appropriate knowledge and skills. Completion of a provincial government approved common core program in electronics is required prior to starting an electronics apprenticeship. This common core program is offered by many colleges, university colleges and the British Columbia Institute of Technology. Admission generally requires grade 12 or equivalent, with appropriate English, mathematics and science courses.

Apprenticeship programs are in place for community antenna television (CATV) technicians, electronics communications technicians, electronics technicians and electronics technicians (consumer products). These training programs take four years to complete. In addition to on-the-job training, the CATV apprenticeship program also incorporates eight weeks of in-school training. In-school training for the electronics communications technician apprenticeship program is expected to be implemented in the near future. Upon completion of the CATV apprenticeship, apprentices receive a Certificate of Apprenticeship and a Certificate of Qualification. Students who complete the electronics communications technician or electronics technician programs receive a Certificate of Apprenticeship. Local Industry Training and Apprenticeship Commission offices can provide more detail about apprenticeships and certification. They can also provide information about emerging apprenticeships that will meet the demands of new technologies, such as fibre optics.

Workers in this field usually have a strong background in mathematics and science. A willingness to learn and adapt is important, as new technologies are constantly emerging.

Working Conditions

These workers usually have stable employment within a cable company. They work a standard 35 to 40 hour week. They often work outside or at subscribers' homes. Cable companies have grown steadily, and cable services are pre-wired into new housing units.

In 1995 the average worker in this group earned $40,000 per year, which was well above the overall workforce average of $27,900. A full-time, full-year employee averaged $44,200 per year, also above the B.C. workforce average of $39,400.

This is a very small occupational group with around 740 workers in 1998. This is an increase from 590 workers in 1990. There is very little opportunity for self-employment or part-time work, and less than 5% of these workers fall into either of those categories. In the overall workforce, the average rates of self-employment and part-time work are 15% and 26%, respectively.

Almost all of these workers are full-time employees for at least part of the year. About 82% work full time, full year. The unemployment rate for these workers is lower than the rate for the workforce as a whole. There is very little seasonal variation in the availability of work because there is no particular seasonal variation in the demand for services.

Over 80% of these workers work in the radio and TV industry (this includes cable television companies). Companies in the construction industry employ 10% of this group. Those employed in construction are affected somewhat by the seasonal and economic cycles within that industry.

Less than half these workers (49%) are found in the Lower Mainland, compared to 57% of the B.C. workforce. The Okanagan-Kootenay region has overrepresentation of these workers at 24%, Vancouver Island has 19%, and Northern B.C. is home to about 7%.

This occupation is dominated by men, who account for over 94% of employment in this group. Women make up barely 6% of this occupation, although they account for 46% of the B C. workforce.

Most of these workers are distributed across age groups in roughly the same proportions as the overall workforce. There are a few more in the 35 to 44 age group and a slight underrepresentation in the 15 to 24 age group. The average age of these workers is 40, which is just above the average age (38) of the B.C. workforce.

Employment Prospects

Employment in this occupational group is expected to grow more slowly than the all-occupation average. The Canadian Occupational Projection System (COPS) forecasts that between 1998 and 2008 about 70 jobs will be created due to growth within the industry. An additional 310 jobs will become available as workers retire.

Despite the slow growth for this occupation, the cable industry as a whole is growing. Industry sources indicate that changes in technology have brought more services within the reach of those subscribing to cable TV. The growth in the number of Internet users continues to gain momentum. At this point in the evolution of the Internet, dial-up access is within the reach of most Canadian and U.S. customers. As a result, the emphasis of growth has shifted to the fast-expanding medium of broadband industrial cable. The multitude of new technologies, which include such products as personal communications systems and high speed Internet services, have also contributed to the recent major growth in the industry. There are other changes in the industry as other technologies start to compete with cable TV services. Direct satellite reception is now available and may provide an alternative service to cable TV.

Much of the expansion and upgrading work to the cable system in B.C. is already or will soon be completed. High speed, broadband fibre optic cable networks are starting to connect various cities and regions within the B.C. interior. These regional networks will connect to cable networks spanning communities from Vancouver Island and the Lower Mainland through to Winnipeg.

Technological developments in cable and telecommunications require workers in this group to have a better knowledge of electronics to keep pace with changes. Industry sources do not expect that those entering this field will have all of the qualifications they will need for a lifetime of work. It is expected that workers will need to keep upgrading their skills by training in the newer technologies and that they then will be eligible for career progressions into higher skilled areas in the industry.

Additional Information

National Cable Television Institute *http://www.ncti.com*

Industry Training and Apprenticeship Commission
http://www.itac.gov.bc.ca

Applied Science Technologists and Technicians of B.C.
http://www.asttbc.org

Telecommunications Workers Union
http://www.twu-canada.ca

Canadian Cable Television Association *http://www.ccta.ca*

Communications, Energy and Paperworkers Union of Canada (CEP) *http://www.cep.ca*

Related Occupations

- telecommunications line and cable workers (7245)

Plumbers, Pipefitters and Gas Fitters

NOC 725

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	6,260	7,710	8,870

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
1,160	3,360	4,520

Annual Growth 1998-2008 1.4%

Main Industries of Employment

Construction	65%
Gas Distribution Utilities	7%
Pulp and Paper Manufacturing	5%

Employment by Region

Lower Mainland	55%
Vancouver Island	17%
Northern B.C.	9%
Okanagan/Kootenay	18%

Self-employment 18%

Nature of the Work

Workers in this occupational group lay out pipe systems to distribute water, waste water, steam, chemicals and natural gas.

Plumbers install and repair plumbing equipment used for water distribution and waste water disposal. *Steamfitters* and *pipefitters* lay out and repair piping systems carrying water, steam, chemicals and fuel. *Sprinkler system installers* install and repair fire protection sprinkler systems in buildings. *Gas fitters* install and maintain natural gas lines and equipment. Apprentices are included in this group.

Main Duties

The duties of these workers are very similar, even though they operate under different working conditions, and use different types of pipes to carry very different substances. These workers use plans to install their pipes properly, so they must read and interpret blueprints and project specifications. They select the type and size of pipe required for a project and measure, shape and join pipes according to the project specifications. In some cases, they modify structures to accommodate the pipes. Once the pipes are in place, they test systems for leaks. After installation, they maintain pipes to prevent or repair leaks. Their areas of specialization come in knowing the particular characteristics of the substances being carried. Handling water is very different from handling steam, or chemicals or natural gas.

Despite the similarities in these occupations, there are major differences in the working conditions and the employers. Plumbers and gas fitters work largely in the construction industry laying new pipe for buildings, while steamfitters and pipefitters work mainly in large industrial plants maintaining existing systems.

Plumbers and *gas fitters* install and repair the water, waste disposal, drainage and gas systems in homes and in commercial and industrial buildings. They install plumbing fixtures, such as bathtubs, showers, sinks, and toilets, and appliances, such as dishwashers and water heaters.

Pipefitters install and maintain both high- and low-pressure systems that are used in manufacturing, in the generation of electricity and in heating and cooling buildings. They also install automatic controls that increasingly are being used to regulate these systems. Some pipefitters specialize in only one type of system. *Steamfitters*, for example, install pipe systems that move liquids or gases under high pressure, while *sprinklerfitters* install automatic fire sprinkler systems in buildings. These systems carry water or other fire-control substances, such as foam.

Plumbers and pipefitters use many different materials and construction techniques, including copper, steel and, increasingly, plastic pipe that can be handled and installed by one or two workers. They also use large cast iron and concrete pipes, which require a crew of pipefitters to install. Some plumbers have to cut holes in walls, ceilings and floors, and hang steel support from ceiling joists to hold the pipe in place. Using pressure gauges, they check the system to ensure that the plumbing works properly.

Those in business for themselves prepare cost estimates for clients. Gas fitters must also advise clients on safety and maintenance.

Example Titles

plumbers (7251):

- maintenance plumber
- plumber
- apprentice plumber
- plumbing mechanic

steamfitters and pipefitters (7252):

- marine pipefitter
- pipefitter
- steamfitter

sprinkler system installers (7252):

- apprentice steamfitter, pipefitter
- apprentice sprinkler system installer
- fire sprinkler fitter
- sprinkler system fitter
- sprinkler system installer

gas fitters (7253):

- apprentice domestic/commercial gas fitter
- apprentice industrial gas fitter
- gas fitter
- gas servicer

Education and Training

To work as a *plumber* or a *steamfitter* and *pipefitter* in B.C. it is compulsory to be certified in the trade or to be registered in a four-year apprenticeship that will lead to qualification. These apprenticeships include four sessions totaling 26 weeks of in-school training. Training is offered by the University College of the Cariboo, Camosun College and the British Columbia Institute of Technology (BCIT). Upon completion of an apprenticeship, apprentices must pass an interprovincial standards examination to receive a Certificate of Qualification with an interprovincial Red Seal endorsement.

While certification is not mandatory to be a *gas fitter*, a two-year Domestic/Commercial Gas Fitter apprenticeship is available. This apprenticeship includes 12 weeks of in-school technical training that is delivered through BCIT. Apprentices must pass a Provincial "B" Gas Fitter Exam to receive a Certificate of Apprenticeship and a Class "B" Gas Fitter Licence. Completion of entry-level training programs may confer credit toward some of the required technical training. Recommended education prior to this apprenticeship is grade 12 or equivalent, with appropriate English, mathematics and science courses.

Upon completion of the Domestic/Commercial Gas Fitter apprenticeship, individuals may take another two-year apprenticeship in Industrial Gas Fitting. This apprenticeship does not require any in-school technical training. A Provincial "A" Gas fitter Exam is administered, following completion of the Industrial Gas Fitting apprenticeship, in order to receive a Certificate of Apprenticeship and a Class "A" Gas Fitter Licence.

Current details regarding these apprenticeships can be obtained by contacting a local area office of the Industry Training and Apprenticeship Commission.

Plumbers, pipefitters and gas fitters must have mechanical aptitude, manual dexterity, an ability to read and understand complex instructions and an ability to do careful and exacting work. They must be very good with numbers and have sufficient physical strength and stamina to lift heavy materials and stand for long periods. They need to be comfortable with a wide range of power hand tools, power machines, torches and welding equipment. Workers in these occupations should be prepared to learn about new developments in their trade. Those with extra skills, such as general welding and basic electricity, will have improved employment prospects.

Working Conditions

Working conditions in the piping trades are often cramped and may involve moving in awkward spaces. Some positions may require that those employed in this group work at considerable heights. Those in industrial settings may work in factories or in manufacturing and often the conditions are noisy and smelly.

The average earnings in these trades are above the B.C. workforce averages, according to 1995 salary figures. The average earnings of all workers in this category were $31,400, while full-time, full-year workers earned $40,600. The respective all-occupation averages in the province in 1995 were $27,900 and $39,400.

According to a recent survey of college graduates, there is a large spread in the starting salaries in these trades. *Gas fitters* started at $3,050 per month ($36,600 per year), while *steamfitters* and *pipefitters* employed in large industrial plants started at $3,190 per month ($38,300 per year). *Plumbers* started at an average of $2,230 per month ($26,700 per year).

According to the Construction Labour Relations Association summary of union agreements, plumbers earned between $33.02 and $34.97 per hour at the beginning of 1996.

In 1990 there were 6,260 workers in these occupations. With almost 7,710 workers in 1998, this is a large occupational group. Within this large overall group, plumbers and steamfitters are both medium-sized occupational groups, while the gas fitters form a small occupational group. About 55% of the total employed in this group are plumbers, 28% are steamfitters, pipefitters and sprinkler system installers, and about 13% are gas fitters.

Approximately 18% of these workers are self-employed, slightly higher than the 15% workforce average. Both plumbers, with 25% self-employment, and gas fitters, with 18% self-employment, have a much higher proportion of self-employment than steamfitters (4%). Many steamfitters work in industrial plants where there is little opportunity to subcontract their services.

For those in the plumbing trades, like most construction occupations, employment is subject to seasonal and economic variations. During downturns, many of these workers may be unemployed between projects. Since much piping work is indoors or under cover, employment is not affected as much by seasonal influences as it is in other construction trades. However, construction of gas pipelines is largely outdoor work and subject to weather conditions.

About 91% of these workers consider themselves full time, although only 46% work full time, full year. The cyclical nature of the construction industry results in periodic unemployment between projects. Thus, the unemployment rate in these occupations is much higher than for the workforce as a whole. Even those in the gas fitting trades, who are less affected by fluctuations in construction, have a higher than average unemployment rate.

Employing industries depend to some extent on workers' specialities. The construction industry employs 65% of this occupational group. This figure is higher for plumbers, where 83% are in the construction industry. Another 7% of the whole occupational group are employed by gas utilities (36% of gas fitters), and about 5% are employed by the pulp and paper industry.

This group as a whole is spread across the province in roughly the same proportions as the overall workforce. There are about 55% in the Lower Mainland, 17% on Vancouver Island, 18% in the Okanagan/Kootenay region and 9% in Northern B.C. However, gas fitters are more prevalent in the Okanagan/Kootenay region (18%) and Northern B.C. (11%) compared to the overall population distribution of the workforce.

Less than 1% of the workers are women as this occupation is dominated by men. By comparison, women make up 46% of the overall workforce.

The age distribution of these workers is similar to the overall B.C. workforce. The average age of workers in this group is 38.

Employment Prospects

Overall, the occupational group of *plumbers, pipefitters* and *gas fitters* is expected to grow about as fast the average for all occupations over the 1998 to 2008 period, according to the Canadian Occupational Projection System (COPS). Over this period, COPS projects that there will be 4,520 openings in this occupational group. Three-quarters of these will become available as people retire. Industry sources agree that most openings will come from the need to replace workers leaving the workforce. Industry sources indicate that even in our current period of slack employment, there are some shortages of fully qualified and well-experienced tradespersons.

Within this occupational group, employment for steamfitters is projected to grow at 1.4% per year. Steamfitters are employed in large industrial plants, such as pulp and paper mills. This industry expanded in the late 1960s and is not expected to expand further. Some modernization of existing mills will occur if the resource industries remain profitable, but this will not provide much of a boost to employment.

The recent expansion in the use of natural gas has created a demand for gas fitters, so this category of workers is expected to show average annual employment growth of about 1.5%.

Plumbing trades are more dependent on activity in the construction industry, either on housing or industrial investment. The availability of work for plumbers will follow the trends in that industry, which is subject to many swings due to changes in general economic conditions and population growth.

The construction industry in B.C. grew rapidly from 1986 to 1995. However, between 1996 and 1999 construction activity declined due to weaker population growth, slower economic growth and weaker labour markets. Since then, non-residential construction activity has remained relatively stable, but residential housing construction has dropped from its 1994 peak. Low levels of residential construction have subsequently created much pent-up demand for housing. The construction industry is expected to grow at the rate of 1.6% per year between 1998 and 2008. Industry sources expect higher than average levels of residential construction and thus increased employment growth over the short term. Repairs to leaky condominiums that were built in the 1980s and 1990s will also create work in the near future for construction workers.

Construction generally is sensitive to factors such as interest rates and material costs. Population growth and an aging population are also factors that directly affect residential construction activity. Seniors staying longer in their homes, divorce and young people expecting to form their own households are part of the changing demographics and lifestyle changes that are affecting both the quantity and mix of housing that buyers can afford or want. Many contractors and construction tradespersons rely on this residential building activity to generate business.

The construction industry is recovering from the commercial building boom in the early 1990s. Current shortages of high-end office space will stimulate the market for commercial construction once again. Planning and construction of new hotels has recently started to pick up and is driven by the continued popularity of B.C. as a holiday destination for tourists.

Public sector funding for capital projects has been an important source of construction employment. Since the cancellation of the 1997/1998 public institutional construction freeze, there has been a flurry of school construction. The main focus of construction projects over the short term will be in the transportation infrastructure of the province, which includes road and bridge construction and a planned extension of the Sky Train in the Lower Mainland.

Productivity gains through new materials, processes and other new technologies are reducing the need for tradespeople. As a result, increasing construction activity may not create as many jobs as in previous years.

Because the construction industry employs such a large number of workers, there will be a significant number of openings in the long term, especially to replace an aging workforce. In the short term, there will be considerable competition for positions, and new workers will be competing with experienced workers for the available jobs. However, there may be a shortage of apprentices entering the construction industry over the longer term.

Although workers in this field are proficient in using a wide range of hand tools, powered machines, torches and welding apparatus, employability can be improved by acquiring peripheral skills, such as basic electrical skills. Workers can advance to supervisory positions with experience or, more commonly, establish their own contracting businesses.

Additional Information

United Association of Journeymen and Apprentices of the Plumbing, Pipefitting and Sprinklerfitting Industry of the United States and Canada http://www.ua.org

Industry Training and Apprenticeship Commission http://www.itac.gov.bc.ca

Related Occupations

- contractors and supervisors, trades (721)

Metal Forming, Shaping and Erecting Occupations

NOC 726

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	5,530	5,680	6,400

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
720	1,440	2,160

Annual Growth 1998-2008 1.2%

Main Industries of Employment

Construction	33%
Metal Fabrication Manufacturing	28%
Shipbuilding	5%

Employment by Region

Lower Mainland	61%
Vancouver Island	16%
Northern B.C.	8%
Okanagan/Kootenay	14%

Self-employment 7%

Nature of the Work

Workers in this occupational group build, assemble and repair products made of steel or other metals. Most of them work in the manufacturing and construction industries where they make many different products. They work for sheet metal fabrication and welding shops and for manufacturers of structural steel, boilers, plateworkers, aircraft, heavy machinery, transportation equipment and sheet metal and fabricated products. They may also work for shipbuilding companies and welding, ironwork and sheet metal work contractors. Because some of these workers operate large equipment, they are employed by firms large enough to have the money to buy the equipment. Sheet metal workers may use their own equipment and be self-employed contractors.

Welders, who make up an important component of the metal forming trades, are covered separately under NOC 951 Welding, Machining, Metalworking, Woodworking and Related Machine Operators.

Main Duties

Even though these occupations are diverse, all of these workers make products out of metal. They are familiar with the properties of metal and operate specialized metalworking machines. To make products of the desired dimensions and properties, they must read and interpret blueprints or specifications. They fit and join metal parts into the desired products and inspect their workmanship to ensure product quality.

Sheet metal workers install and repair sheet metal products. *Boilermakers* assemble and repair boilers, vessels, tanks, heat exchangers and other heavy metal structures. They set up and operate brakes, rolls, shears, flame cutters and other heavy metal products and drill and install boilers according to specifications using hand and power tools.

Structural metal and *platework fabricators* and *fitters* assemble and fit metal sections and plates to make buildings, bridges, tanks, boilers and pressure vessels. They use tack welding, bolting or other methods. This work is often intricate, and fabricators and fitters must construct patterns and templates as guides for layouts.

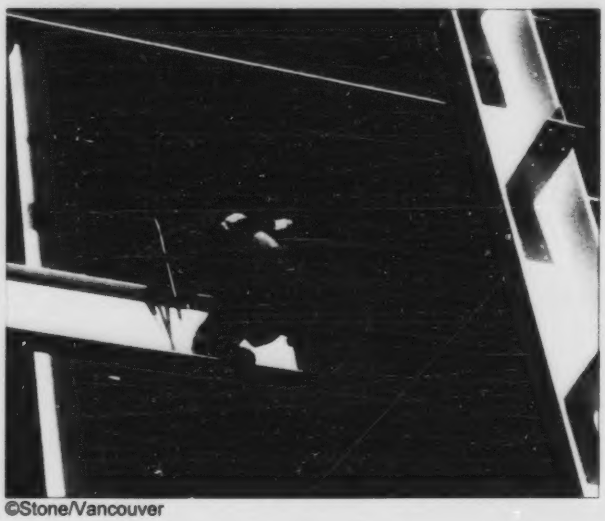
Ironworkers fabricate, install and repair structural ironwork, precast concrete, concrete reinforcing materials, curtain walls, ornamental iron and other metals used in construction. They communicate with crane operators to position steel units and fix these units in place.

Blacksmiths forge a variety of metal items, such as tools, chains, wrought iron fixtures, agricultural implements and structural components. They also may be contracted to devise special tools, jigs or fixtures. Other duties include tempering, hardening or annealing forged items.

Die setters set up forging machines, such as forging presses, drop hammers and forging rolls. These machines form metal by a mechanical or hydraulic press with or without heat. They check the initial operation of forging machines to ensure that machines are set up properly for use by forging machine operators.

Blacksmiths and die setters work with forges that operate at high temperatures to shape heavy metal components. Workers in other metal trades may guide heavy metal parts being lifted into position by a crane.

Some of these workers are employed in the maintenance departments of large industrial complexes. They regularly inspect boilers, tanks, pipes and heavy metal products and repair them when necessary.



©Stone/Vancouver

Workers in many of these trades use welding equipment to join sheets of metal and must have knowledge of the specialized welding techniques used for many of the metal alloys.

F6

Example Titles

sheet metal workers (7261):

- apprentice sheet metal worker
- apprentice sheet metal worker, manufacturing
- coppersmith
- sheet metal fabricator
- sheet metal mechanic
- sheet metal worker

boilermakers (7262):

- boilermaker
- apprentice construction boilermaker
- construction boilermaker
- marine boilermaker
- shop fabrication boilermaker

structural metal and platework fabricators (7263):

- apprentice metal fabricator
- metal fabricator
- plater
- platework fitter
- apprentice shipfitter
- shipfitter
- structural steel fitter

ironworkers (7264):

- apprentice ironworker
- ironworker
- ornamental ironworker
- reinforcing ironworker
- structural steel erector

blacksmiths and die setters (7266):

- blacksmith
- die setter
- toolsmith

Education and Training

To work as a *sheet metal worker* in B.C. it is compulsory to be certified in the trade or be registered in a four-year apprenticeship that will lead to qualification. In addition to on-the-job training, students are required to complete four in-school technical training sessions of six weeks each. Camosun College and the British Columbia Institute of Technology (BCIT) offer certificate programs in sheet metal working. The Sheet Metal Workers Training Centre is a private post secondary institution that offers courses to apprentices and journeypersons. Sheet metal workers who gain experience over the years may progress to supervisory positions.

While certification is not required to work as a *construction boilermaker* or *iron worker*, apprenticeships are available. Prior to these three year apprenticeships, individuals must first complete a mandatory six-month entry level (pre-apprentice) course. The apprenticeship in-school technical training is comprised of two sessions of five weeks each. BCIT offers Boilermaking Certificate and Ironworking Certificate programs.

Although not mandatory, *metal fabricator* apprenticeships take four years, including four sessions of in-school technical training of five weeks each. BCIT offers a Steel Fabricating Certificate, and the Sheet Metal Workers Training Centre has relevant courses as well. Courses or programs in welding, machining, steel fabricating and joinery will provide basic preparation for entry into the fabrication profession.

Certification for these professions requires completing the apprenticeship and passing an interprovincial examination to receive a Certificate of Apprenticeship and a Certificate of Qualification with the Red Seal endorsement. Individuals who have worked for a long time in their jobs but have never completed an apprenticeship may be exempt from the apprentice program yet still receive a Certificate of Qualification. The certificate is awarded following submission of evidence of substantial full-time experience in the trade plus successful completion of an exam.

A two-year apprenticeship is usually required to work as a *sheet metal worker (manufacturing)* and *architectural sheet metal worker*. Twelve weeks of in-school technical training is required for these programs, and students earn a Certificate of Apprenticeship when complete. Educational courses are available through BCIT, Camosun and the Sheet Metal Workers Training Centre.

Recommended education prior to beginning an apprenticeship is generally grade 12 or equivalent, with appropriate English, mathematics and science courses. Previously acquired work experience and technical training may qualify as credit toward some of the apprenticeship. Current details regarding these apprenticeships can be obtained by contacting a local Industry Training and Apprenticeship Commission area office.

Training for the *blacksmith* trades can be taken at Kootenay School of the Arts in Nelson. Students may graduate from a three-year program with a Diploma in Art, Craft and Design with specialization in metal work. Individuals become proficient in this profession through work experience.

Individuals in these trades generally require initiative, a willingness to learn, mechanical aptitude, manual dexterity, good coordination and physical strength. Due to the hazardous conditions of this work, these workers must also follow safety procedures closely. Further, they must be able to visualize a finished product from a drawing. To do this, excellent knowledge of shop mathematics, geometry and blueprint reading is important. These trades require workers with knowledge of computerized equipment, good analytical skills and effective communication skills.

Working Conditions

Because of the diversity of occupations and employers in this occupational group, there is also a diversity of working conditions. Those employed in manufacturing firms work in enclosed buildings and are not subject to weather conditions. However, they have to put up with factories that are often noisy, smelly and dirty. They may also have to take shift work, as many factories operate 24 hours a day.

Those working on construction sites often work outdoors. They may have to relocate temporarily to remote areas for work on major construction projects. Often they work at heights on scaffolds or in cramped and awkward positions. They are subject to the cyclical swings in the construction industry and face periods of unemployment between projects.

Sheet metal workers often work for speciality contractors and enjoy regular work schedules of 35 to 40 hours per week.

Boilermakers often work in cramped and uncomfortable conditions and are exposed to chemical vapours or wetness. When inside boilers, they often work at considerable heights and are exposed to high noise levels. They must wear protective clothing and other safety gear.

Work in these trades can be dangerous, and errors in judgement can lead to injury or damage to equipment and materials. Workers must be conscious of the risks and apply safety procedures. These trades also require physical strength, as heavy lifting is often required.

The estimated average annual earnings in 1995 for these trades were $33,000, while full-time, full-year earnings were $40,600. Both of these figures are above the workforce averages of $27,900 and $39,400, respectively.

In a survey of recent college graduates, new entrants into these trades earned between $2,380 and $3,470 per month. This is equivalent to $28,600 to $41,600 per year. Sheet metal workers earned the least, while boilermakers earned the most.

In 1998 there were about 5,680 workers in these trades, making it a large occupational group. This is up slightly from 5,530 in 1990. Within this group, structural metal and platework fabricators comprise 39%, and sheet metal workers make up 34%. Ironworkers account for another 17%, boilermakers 8% and blacksmiths about 1%.

In these trades, there is little opportunity for part-time work or self-employment. About 7% are self-employed, and about 6% work part time. The B.C. all-occupation averages for self-employment and part-time work are 15% and 26%, respectively. While 94% of these workers are employed full time for at least part of the year, only 46% work full time, full year. The full-time, full-year average for the entire workforce is 47%.

The unemployment rate for these workers is much higher than the workforce average (more than twice as much) and is even higher than in many of the construction trades. These workers experience a low incidence of full-year work. Those workers in the construction industry are subject to temporary layoffs due to the seasonal availability of work and the project-to-project nature of the industry. Those in the manufacturing industries tend to have more permanent positions. However, many of these workers work in job shops that rely on major contracts, and they too experience temporary layoffs between projects. Some of the unemployment affects lesser skilled workers who are being replaced by technology or are less in demand at project sites.

The construction industry employs about 33% of these workers. The metal fabrication industry employs a further 28% of the workers. These industries manufacture diverse metal products, such as boilers, doors and ornaments. Shipbuilding, machinery construction and wholesale trade each account for about 5% of these workers. The rest are spread out through other manufacturing and service industries.

These workers are found in roughly the same proportions throughout the province as the overall workforce. There are slightly more in the Lower Mainland (61%), while Vancouver Island is home to about 16% of these workers, the Okanagan/Kootenay region has 14%, and Northern B.C. has 8%.

Women still make up less than 2% of workers in this occupational group. By comparison, women account for 46% of the overall workforce.

The average age of these workers is 38, the same as the provincial average for all workers. These workers are concentrated in the 25 to 44 age groups (62%) and are underrepresented in the 15 to 24 age group.

Employment Prospects

According to the Canadian Occupational Projection System (COPS), employment in these metal trades is forecast to grow more slowly than the average for all occupations through to the year 2008. A total of 2,160 jobs will become available, of which only 720 will be created through economic growth. The balance, 1,440 jobs (or 67%), will become available as workers retire.

Industry sources agree with the COPS projected growth rate. If the economy of B.C. grows, however, the outlook for these occupations would improve. Sources agree that most job openings will come from retirements. There are significant numbers of older workers in some of these trades, such as boilermakers and metal fabricators. As they will soon retire, opportunities for new workers will come available.

Industry sources note that the techniques in these trades are constantly changing to accommodate the use of larger sections of metal in construction, the increasing number of alloys requiring special handling and the increased use of fibreglass. This has created a number of specialties within each of the trades.

The largest occupational group in these metal trades are the *structural metal* and *platework fabricators*. This group is projected to have 930 employment openings from 1998 to 2008, or over 40% of the employment openings of all of these metal trades.

Over a third of this occupational group are *sheet metal workers*. This occupation is not as mobile as the boilermakers, and most work is conducted in B.C. in the commercial and residential sector. Work is dependent on the rise and fall of the economy, particularly in construction. Industry sources indicate that while there is presently a stable workforce of sheet metal workers in B.C., there may be shortages in the future if not enough young people enter apprenticeships to replace older workers when they retire.

Boilermakers are a very small occupation within this group. Most construction boilermakers in B.C. work in maintenance as there are very few heavy industry projects underway in the province. Boilermakers are generally mobile and move to where the work is. Industry sources indicate that there will be better opportunities in Western Canada, particularly Alberta, and in the U.S.A. over the forecast period.

With experience, workers in these trades can advance to supervisory positions. In the case of sheet metal workers, there are also opportunities to establish small businesses to subcontract on construction projects or offer services to home owners.

Additional Information

British Columbia Sheet Metal Association
http://www.smacna-bc.org/smacna_bc.html

Industry Training and Apprenticeship Commission
http://www.itac.gov.bc.ca

Related Occupations

- welders and machining, metalworking, woodworking and related machine operators (951)
- aircraft sheet metal technician (in 731 machinery and transportation equipment mechanics)
- underwater welder (in 7382 commercial divers)
- contractors and supervisors, trades (721)

Carpenters and Cabinetmakers

NOC 727

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	22,070	23,120	26,630

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
3,510	5,450	8,960

Annual Growth 1998-2008 1.4%

Main Industries of Employment

Construction	75%
Wood Manufacturing	6%
Furniture Manufacturing	3%

Employment by Region

Lower Mainland	51%
Vancouver Island	20%
Northern B.C.	9%
Okanagan/Kootenay	20%

Self-employment 34%

Nature of the Work

Carpenters build and repair structures made of wood, wood-substitutes and other materials. *Cabinetmakers* construct and repair wooden cabinets, furniture, fixtures and related products. These tradespeople work mainly with wood, even though materials such as plastics and metal are increasingly being used in construction. This is a very large group of workers in this province.

Carpenters are employed by construction companies, carpentry contractors, and maintenance departments of factories, plants and other establishments. Cabinetmakers are employed by furniture manufacturing or repair companies, construction companies and cabinetmaking contractors. In both groups, many are self-employed. Apprentices are also included in these occupations.

Main Duties

Both *carpenters* and *cabinetmakers* construct things out of wood, and in some cases their duties are very similar, though cabinetmaking tends to be a more specialized trade than carpentry. Both are required to read and interpret plans in order to understand what they are to build. Using architectural drawings, they operate woodworking machines to cut and form parts. Then they fit parts and subassemblies together to form complete units. Workers in both trades may supervise apprentices and prepare cost estimates for clients.

Carpenters build foundations, install floor beams, lay subflooring, erect walls and roof systems, fit and install trim items, and maintain wooden structures in mills, mines, hospitals and industrial plants. *Cabinetmakers* build, repair or restyle wooden furniture, cabinets, fixtures and other products.

There are different skill levels within these trades. *Rough carpenters* construct forms, frame buildings and assemble basic structures. *Finishing carpenters* work on the final stages of construction, such as the installation of doors, mouldings, stairs, and so forth. Experienced cabinetmakers make and install more precise cupboards and cases. Increasingly, carpenters are being called upon to install pre-manufactured assemblies, resulting in a decreased demand for workers on-site.

Example Titles

carpenters (7271):

- apprentice carpenter
- apprentice joiner
- apprentice logbuilder
- apprentice machinist (mould shop)
- apprentice shipwright
- carpenter
- finishing carpenter
- framing carpenter
- journeyman/woman carpenter
- maintenance carpenter
- renovation carpenter
- rough carpenter

cabinetmakers (7272):

- custom wood furniture maker
- cabinetmaker
- furniture cabinetmaker

©Stone/Vancouver

Education and Training

Although certification is not required to work as a *carpenter* or *cabinetmaker/joiner*, most employers require their employees to complete a four-year apprenticeship. The carpenter apprenticeship involves four in-school technical training sessions of six weeks each. Joiner apprenticeships involve four in-school technical training sessions of five weeks each. Completion of an entry-level training program may confer credit towards some of the required technical training for either apprenticeship. Technical training for these professions is available at many provincial colleges, university colleges and the British Columbia Institute of Technology. Upon completion of in-school and on-the-job training, apprentices are recommended to write an interprovincial standards examination to receive a Certificate of Qualification with an interprovincial Red Seal endorsement. The Industry Training and Apprenticeship Commission (ITAC) recommends the completion of grade 12 or equivalent, with appropriate English, mathematics and science courses, prior to beginning an apprenticeship.

For people who have worked for a long time in one of these trades but have never completed an apprenticeship, a Certificate of Qualification is available. The certificate is awarded following submission of evidence of six years' full-time experience in carpentry or joinery and successful completion of an exam. North Island College and the University College of the Fraser Valley offer carpentry trade qualification programs that are designed for professional carpenters to help prepare them to write the trade qualification exam.

Current details regarding these apprenticeships can be obtained by contacting an ITAC local area office.

Post secondary institutions in B.C. also offer courses and programs in this area, which may be of interest to those who do not wish to pursue apprenticeship training. For cabinetmakers, Selkirk College offers a nine-month Fine Woodworking Certificate and Camosun College has a ten-month Fine Furniture Certificate program.

Carpenters and joiners should be physically fit, have manual dexterity and possess good hand-eye coordination. Both trades require an ability to read and interpret blueprints, drawings and other specifications. These tradespeople must be able to prepare layouts in accordance with building codes and use hand and power tools as well as computerized machinery. Joiners need to be comfortable with computers since woodworking machines are becoming increasingly computerized. Continued skills upgrading is generally necessary to be successful, and broadening of trade skills is an asset.

Working Conditions

Because most of these tradespeople work in the construction industry, their work is affected by the booms and busts in this industry, which result from changes in business cycles and the weather. Much of the work is done outside. However, even inside work is affected by the decreased activity in the industry during the winter months. *Carpenters* usually work on a project-by-project basis. Because of these factors, construction workers must be able to go where the work is and be prepared for temporary layoffs during slow periods.

These workers may be members of a construction union and will work out of a union hiring hall. Work requests come through the hiring hall and are allocated to members on a rotating basis. A typical work week is 35 to 40 hours, but overtime is common in order to complete projects on time.

Current trends indicate that there will be decreasing numbers of union positions, although these occupations traditionally have been highly unionized. According to the Construction Labour Relations Association of B.C., unionized carpenters were paid between $31.56 and $33.43 per hour in 1995.

The average earnings for these workers in 1995 were $22,300, below the average for the overall B.C. workforce ($27,900). Those who worked full time, full year earned $31,200, which is also less than the workforce average for full-time work ($39,400). However, these salary figures include apprentices, who are only paid a percentage of the salary of journeyed workers. Industry sources estimate that qualified workers can earn between $36,000 and $40,000 during the busiest months (March to November).

Lower than average wage levels were more pronounced in the case of women workers. The average annual earnings for all women in these trades in 1995 were $16,800, while for women who worked full time, full year they were $19,900. Women make up only 2% of the workers in this occupational group, and most of these women workers (73%) are carpenters.

A survey of recent college graduates found that entry-level workers in these occupations started at $1,870 per month ($22,400 full time, full year) for cabinetmakers and $2,510 per month ($30,100 full time, full year) for carpenters.

Carpenters are among the most numerous of skilled construction tradespeople because they work on all types of construction projects. This is a very large occupational group. In 1998 total employment for carpenters and cabinetmakers was 23,120. This is up from 22,070 in 1990. Carpenters account for about 88% of this occupational group.

About 34% of carpenters and cabinetmakers are self-employed and undertake many small projects. This proportion is higher than the workforce average for self-employment (15%).

There are fewer part-time workers (15%) in this group compared to the total workforce (26%). There is a growing trend to have carpenters assist clients on renovation projects. It is an activity that some carpenters engage in between projects, rather than pursue as an alternative career. Even though 85% consider themselves full-time workers, only 31% work full time for the whole year.

Unemployment rates are much higher for carpenters than for the provincial workforce as a whole. Cabinetmakers have a lower unemployment level than carpenters, but have the same unemployment rate as the overall average. This is related to the cyclical nature of construction and the seasonal slowdowns within the industry, which result in numerous layoffs during the year.

The construction industry employs 75% of these workers. The other big employers are the wood industry and the furniture industry, which together hire about 9% of the workers.

A greater proportion of these workers live in rural areas compared to the workforce average. The Lower Mainland has about 51%, while the Okanagan/Kootenay and Vancouver Island regions have more of these workers (20% each) than their proportional share of the B.C. workforce. The remaining 9% are in Northern B.C., which is representational of the workforce population in that region. Many resource development projects are taking place outside of urban areas. This is a very mobile section of the workforce. It's not unusual for carpenters and cabinetmakers to move from one region or location to another to take a job, or to relocate temporarily to work on a project.

Although women have been entering this field, they make up barely 2% of these workers. The average age of women in these occupations is 37 years.

The average age for all workers in this field is 39, which is just above the provincial average (38). Almost a third of the workers in this group are in the 35 to 44 age group, a slightly higher than average share compared to the workforce as a whole.

Employment Prospects

Employment in carpentry trades is forecast to grow at about the average for all occupations through to 2008, according to the Canadian Occupational Projection System (COPS). Based on the historic relationship between population growth and construction activity and with the anticipation of generally good investment and housing activity, COPS projects that about 3,510 new jobs will be created between 1998 and 2008, and 5,450 replacement jobs (60% of total openings) will become available as workers retire.

Construction is the major industry of employment for workers in this occupational group. The construction industry in B.C. grew rapidly from 1986 to 1995. However, between 1996 and 1999 construction activity declined due to weaker population growth, slower economic growth and weaker labour markets. Since then, non-residential construction activity has remained relatively stable, but residential housing construction has dropped from its 1994 peak. Low levels of residential construction have subsequently created much pent-up demand for housing. The construction industry is expected to grow at the rate of 1.6% per year between 1998 and 2008, which is the same rate as the provincial average for all industries. Industry sources expect higher than average levels of residential construction and thus increased employment growth over the short term. Repairs to leaky condominiums that were built in the 1980s and 1990s will also create work in the near future for construction workers.

Construction generally is sensitive to factors such as interest rates and material costs. Population growth and an aging population are also factors that directly affect residential construction activity. Seniors staying longer in their homes, divorce and young people expecting to form their own households are part of the changing demographics and lifestyle changes that are affecting both the quantity and mix of housing that buyers can afford or want. Many contractors and construction tradespersons rely on this residential building activity to generate business.

The construction industry is recovering from the commercial building boom in the early 1990s. Current shortages of high-end office space will stimulate the market for commercial construction once again. Planning and construction of new hotels has recently started to pick up and is driven by the continued popularity of B.C. as a holiday destination for tourists.

Public sector funding for capital projects has been an important source of construction employment. Since the cancellation of the 1997/1998 public institutional construction freeze, there has been a flurry of school construction. The main focus of construction projects over the short term will be in the transportation infrastructure of the province, which includes road and bridge construction and a planned extension of the Sky Train in the Lower Mainland.

Productivity gains through new materials, processes and other new technologies are reducing the need for carpentry tradespeople. As a result, increasing construction activity may not create as many jobs as in previous years.

Because the construction industry employs such a large number of workers, there will be a significant number of openings in the long term, especially to replace an aging workforce. In the short term, there will be considerable competition for positions, and new workers will be competing with experienced workers for the available jobs. However, there may be a shortage of apprentices entering the construction industry over the longer term.

Carpenters and *cabinetmakers* also do a considerable amount of renovation work. Some consumers are renovating their homes rather than purchasing newer or bigger houses. While in some cases the homeowner takes on this renovation as a do-it-yourself project, in many other cases this work is done by self-employed or small business carpenters.

Cabinetmakers represent 12% of this occupational group. Between 1998 and 2008 they will fare slightly better in job growth (1.6% annual average growth) compared to 1.4% for carpenters. This growth represents total job openings of 1,110 for cabinetmakers.

Carpenters and *cabinet makers* will increasingly need computer literacy skills in the future to operate computer-controlled equipment and to work with computer-based systems in drawing, estimating, coordination and cost reporting. They will also have to be more familiar with energy conservation features, as well as the use of pre-fabricated components, particularly for low-rise housing and condominiums. Assembly will be done within the factory, then transported to the construction site. With pre-assembly, there will be an increased need to understand specific subsystems (for example, floor systems, wall systems). This trend will lead to a shift in some job functions for some carpenters from craftsperson tasks to assembly tasks.

Hiring is sometimes done through union halls, though direct contact with potential employers is often a better source of employment opportunities. As with many apprenticeable trades, apprentices are often chosen from the ranks of a company's current employees, such as construction labourers. In both of these occupations, tradespeople can advance to supervisory positions or start their own businesses.

Additional Information

Industry Training and Apprenticeship Commission
http://www.itac.gov.bc.ca

Related Occupations

- woodworking machine operators (in 951 welders and machining, metalworking, woodworking and related machine operators)
- residential and commercial installers and servicers (in 744 other installers, repairers and servicers)
- contractors and supervisors, trades (721)

7

Masonry and Plastering Trades

NOC 728

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	8,500	7,290	8,070

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
780	3,030	3,810

Annual Growth 1998-2008	1.0%
Main Industries of Employment	
Construction	88%
Motor Vehicles, Trailers and Parts Manufacturing	5%
Non-Metallic Minerals	2%
Employment by Region	
Lower Mainland	59%
Vancouver Island	19%
Northern B.C.	5%
Okanagan/Kootenay	17%
Self-employment	34%

Nature of the Work

Builders use a variety of coating materials, such as stone, bricks and concrete to cover walls and floors. Specialized tradespeople are used to install these materials. This group includes bricklayers, cement finishers, tilesetters, plasterers, drywall installers and lathers.

These tradespeople are employed by subcontractors, or they may be self-employed. Related apprentices are also included in this group.

Main Duties

The job titles describe the different duties of these trades. All of these workers prepare surfaces to be covered, including placing openings or special fasteners. They mix ingredients, such as mortar, cement, grout, plaster or stucco, install coverings according to plans and finish surfaces as required.

Bricklayers (masons) lay bricks, concrete blocks, stone, structural tiles and other materials to construct or repair walls, foundations and other structures. They also lay or install firebricks to line chimneys, furnaces, kilns and boilers. Other duties include laying bricks, stone or similar materials to provide veneer facing to walls, and building patios, garden walls, fireplaces and other decorative installations.

Cement finishers (cement masons) smooth and finish freshly poured concrete, apply surface treatments, and restore concrete structures. They operate power vibrators to compact concrete and apply hardening and sealing compounds to cure concrete surfaces. They install anchor bolts, steel plates, door sills and other fixtures in freshly poured concrete. They also waterproof, damp-proof and restore concrete surfaces, and repair, resurface and replace damaged sections of floors, walls, roads and other concrete structures.

Tilesetters cover interior and exterior walls, floors and ceilings with ceramic, marble and quarry tile. They mix, apply and spread mortar, cement, glue and other adhesives using hand trowels, set tiles in position and apply pressure to affix tiles to a base.

Terrazzo workers create attractive walls, walkways, floors, patios, and panels by exposing marble chips and other fine aggregates on the surface of finished concrete.

Plasterers apply coats of plaster to interior and exterior walls, ceilings and building partitions. They also trowel or spray coats of stucco over building exteriors to weatherproof surfaces. They spray acoustic materials or texture a finish over walls and ceilings. Plasterers also apply insulation board and special polymers to the exteriors of new and old buildings.

Drywall installers attach drywall sheets to walls and various types of ceiling systems. They use a taping machine to tape over seams and joints. They also sand seams and joints, fabricate and install suspended metal ceiling grids and install panels to form acoustical and recessed ceilings.

Lathers install support frameworks for ceiling systems, interior and exterior walls and building partitions to prepare for the installation of interior drywall or plaster walls and ceilings.

Example Titles

bricklayers (7281):
- apprentice mason
- bricklayer
- brickmason
- mason
- stonecutter
- stone or marble mason

cement finishers (7282):
- cement finisher
- apprentice cement finisher
- cement mason
- concrete finisher
- precast concrete finisher

tilesetters (7283):
- apprentice tilesetter
- ceramic tile installer
- marble setter
- terrazzo worker
- tilesetter

plastering trades (7284):
- apprentice drywall finisher
- apprentice lather (interior systems mechanic)
- apprentice plasterer
- acoustical ceiling installer
- ceiling installer
- drywall finisher
- interior systems mechanic
- lather
- plasterer
- sheetrock applicator
- wood lather

Education and Training

Masons, cement masons, tilesetters, plasterers, lathers and drywall finishers are included in this occupational group. While none of these professions are required to be certified to work, apprenticeships are available in each of these trades. For all of these occupations, the Industry Training and Apprenticeship Commission (ITAC) recommends completion of grade 12 or equivalent, with appropriate English, mathematics and science courses.

Masons (bricklayers) apprentice for four years, which includes four in-school training sessions of five weeks each. Training is offered at Kwantlen University College. Completion of an entry-level training program may confer credit towards some of the required technical training. Upon successful completion of on-the-job training and in-school technical training, an apprentice must pass an interprovincial standards examination to receive a Certificate of Apprenticeship and a Certificate of Qualification with an interprovincial Red Seal endorsement.

Cement mason apprenticeships are three years in duration and include three sessions of in-school technical training of four weeks each, offered at Kwantlen University College. Apprentices also learn required skills and knowledge on the job from a journeyperson cement mason. Upon completion, apprentices are required to pass an interprovincial standards examination before being issued a Certificate of Apprenticeship and a Certificate of Qualification with an Interprovincial Red Seal endorsement.

Tilesetters apprentice for three years and are required to attend three technical training sessions of four weeks each. Training is completed at the Tile Terrazzo and Marble Training Facility in Burnaby. Upon completion of an apprenticeship, an apprentice receives a B.C. Certificate of Apprenticeship and Certificate of Qualification as a tilesetter.

Plasterers apprentice for four years and are required to take three sessions of technical training of four weeks each at the British Columbia Institute of Technology (BCIT). Upon completion of an apprenticeship, an apprentice receives a B.C. Certificate of Apprenticeship and a Certificate of Qualification.

Lathers (interior systems mechanic) apprentice for four years and must complete four sessions of in-school technical training, totalling 22 weeks, at BCIT. Completion of an entry-level training program may confer credit toward some of the required technical training. All apprentices must pass an interprovincial standards examination in order to receive a Certificate of Apprenticeship and a Certificate of Qualification with an interprovincial Red Seal endorsement.

Drywall finishers apprentice for three years and must complete three levels of technical training of four weeks each, which is provided at BCIT. Completion of an entry-level training program may confer credit toward some of the required technical training. Upon completion of an apprenticeship, a Certificate of Apprenticeship and a Certificate of Qualification are issued.

For those who have worked as a mason, lather or plasterer for at least six years but have not completed a B.C. apprenticeship, it is possible to earn a B.C. Certificate of Qualification by passing an examination. To be eligible to write the exam, evidence from employers of six years of full-time experience in the trade must be submitted. Cement masons, tilesetters and drywall finishers may also be eligible to write an exam for their trade, if they have evidence from employers of four-and-a-half years of experience.

Current details regarding these apprenticeships and trade qualification exams can be obtained by contacting a local ITAC area office.

The work in these occupations is often physically demanding and requires healthy individuals with good stamina. These workers need to have good vision, good spatial perception, an ability to estimate size and dimensions and good hand-eye coordination. Artistic skills are a strong asset for much of this work.

Working Conditions

The general working conditions vary with the trade. Like most of the construction industry, these trades demand physical strength and, in some cases, require considerable outdoor work. For example, *cement finishers* often work outdoors, while *drywallers* work almost entirely indoors. A typical work week is 35 to 40 hours, but weekend and evening work, as well as overtime, are common in order to complete projects on time.

Workers in these trades earned an average of $20,800 per year in 1995. Those who worked full time, full year earned $30,100. The respective all-occupation averages in the province in 1995 were $27,900 and $39,400. Cement finishers earned the most, with an average of $24,300. Bricklayers earned an average of $23,300, plasterers earned $19,600, and tilesetters earned an average of $19,000. Those tradespeople who own their own businesses can earn considerably more. In both categories, the men earned more than the women.

There is a range of earnings within this occupational group. A recent graduate survey found that the starting salary for a new college graduate entering these trades ranged from $1,800 per month for a tilesetter to $2,630 per month for a cement finisher.

This is a large occupational group. In 1990 there were 8,500 people employed in these trades. By 1998 this occupation had dropped to 7,290 workers in these trades. More than half (59%) are in the plasterers and drywall installers group. This group applies wall finishings to most walls. The bricklayers and cement finishers constitute about 14% and 16% of this group respectively. The smallest group is the tilesetters (11%).

Just over one-third of these workers are self-employed, compared to 15% of the total workforce. There are numerous opportunities to sub-contract services to general contractors, or to offer services to individual clients.

There is more part-time work being created in these occupations. About 21% of the workers fall into this category, which is slightly lower than the 26% workforce average. Even though 79% are full-time workers for at least part of the year, only 25% actually work full time, full year.

Tradespeople often face seasonal unemployment because of slowdowns in the construction industry during the winter months. The industry is also subject to changes in the general economic climate of the province. The project-based nature of the construction industry results in numerous layoffs for workers during the year. Consequently unemployment rates are much higher than the provincial average, even during periods of high activity in the construction industry. Tilesetters have the lowest unemployment rate in this group, which is still higher than the provincial average. Because of these factors, tradespeople must be prepared to go where the jobs are and to face temporary layoffs while waiting for new projects.

The construction industry employs 88% of these workers. There is limited employment in various service industries and specialty manufacturing sectors, for example, building the framework for recreational vehicles and trailers.

The distribution of these workers generally follows the distribution of the overall workforce in the province, with the exception of Northern B.C., where these workers are slightly underrepresented in proportion to the total workforce.

Women currently make up less than 3% of the workers in these occupations.

The average age for workers in these trades is 37, which is just below the provincial average. About 36% of these workers are in the 25 to 34 age group, and another 31% are in the 35 to 44 age group.

Employment Prospects

This occupational group is expected to grow more slowly than the all-occupation average, according to the Canadian Occupational Projection System (COPS). Based on the historic relationship between population growth and construction activity and with the anticipation of good investment levels, COPS projects that about 780 new jobs will be created between 1998 and 2008. Because of the large size of this occupational group, there will still be a large number of openings due to retiring workers, despite the lower growth rate. The age structure of these workers means that there will be almost four times as many job opportunities resulting from a high number of retirements. About 3,030 replacement jobs are expected to become available as workers retire, for a total of over 3,800 job openings between 1998 and 2008. *Plasterers* and *drywall installers* comprise 59% of this occupational group but are expected to be responsible for 88% of the newly created job openings. *Tilesetters*, on the other hand, are not expected to see any net new jobs, only openings created by workers retiring.

Construction is the major industry of employment for workers in this occupational group. The construction industry in B.C. grew rapidly from 1986 to 1995. However, between 1996 and 1999 construction activity declined due to weaker population growth, slower economic growth and weaker labour markets. Since then, non-residential construction activity has remained relatively stable, but residential housing construction has dropped from its 1994 peak. Low levels of residential construction have subsequently created much pent-up demand for housing. The construction industry is expected to grow at the rate of 1.6% per year between 1998 and 2008, which is the same rate as the provincial average for all industries. Industry sources expect higher than average levels of residential construction and thus increased employment growth over the short term. Repairs to leaky condominiums that were built in the 1980s and 1990s will also create work in the near future for construction workers.

Construction generally is sensitive to factors such as interest rates and material costs. Population growth and an aging population are also factors that directly affect residential construction activity. Seniors staying longer in their homes, divorce and young people expecting to form their own households are part of the changing demographics and lifestyle changes that are affecting both the quantity and mix of housing that buyers can afford or want. Many contractors and construction tradespersons rely on this residential building activity to generate business.

The construction industry is recovering from the commercial building boom in the early 1990s. Current shortages of high-end office space will stimulate the market for commercial construction once again. Planning and construction of new hotels has recently started to pick up and is driven by the continued popularity of B.C. as a holiday destination for tourists.

Public sector funding for capital projects has been an important source of construction employment. Since the cancellation of the 1997/1998 public institutional construction freeze, there has been a flurry of school construction. The main focus of capital projects over the short term will be in the transportation infrastructure of the province, which includes road and bridge construction and a planned extension of the Sky Train in the Lower Mainland.

Productivity gains through new materials, processes and other new technologies are reducing the need for tradespeople. As a result, increasing construction activity may not create as many jobs as in previous years.

Because the construction industry employs such a large number of workers, there will be a significant number of openings in the long term, especially to replace an aging workforce. In the short term, there will be considerable competition for positions, and new workers will be competing with experienced workers for the available jobs. However, there may be a shortage of apprentices entering the construction industry over the longer term.

Future demand may decline for bricklayers/masons in new construction because structural brick is now less often used. As well, there has been an introduction and increased use of prefabricated materials, mortarless bricks, and factory-assembled panelized masonry. Retrofit and restoration work on older structures will be increasing. This trend will require bricklayers to exercise more judgement in matching repairs to existing brickwork.

As with many apprenticeable trades, apprentices are often chosen from the ranks of a company's current employees, such as construction labourers. Red Seal certification for bricklayers, cement masons and lathers means workers are qualified to work in any of the provinces or territories. In these occupations, trades people can advance to supervisory positions or start their own businesses.

Additional Information

Operative Plasterers' and Cement Masons' International Association of the United States and Canada
http://www.opcmia.org

Industry Training and Apprenticeship Commission
http://www.itac.gov.bc.ca

Related Occupations

- residential and commercial installers and servicers (in 744 other installers, repairers and servicers)
- contractors and supervisors, trades (721)

As with many apprenticeable trades, apprentices are often chosen from the ranks of a company's current employees, such as construction labourers. Red Seal certification for bricklayers, cement masons and lathers means workers are qualified to work in any of the provinces or territories. In these occupations, trades people can advance to supervisory positions or start their own businesses.

Other Construction Trades

NOC 729

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	12,250	13,680	15,210

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
1,530	2,310	3,840

Annual Growth 1998-2008

1.1%

Main Industries of Employment

Construction	80%
Retail Trade	5%
Motor Vehicles, Trailers and Parts Manufacturing	2%

Employment by Region

Lower Mainland	57%
Vancouver Island	19%
Northern B.C.	7%
Okanagan/Kootenay	17%

Self-employment

33%

Nature of the Work

This occupational group includes *roofers, shinglers, glaziers, insulators, painters* and *decorators*, and *floor covering installers*, as well as related apprentices. These workers generally install finishing surfaces or supplementary construction materials, rather than structural construction materials, and these are known as construction finishing trades. Many of these workers are subcontractors and independent tradespeople who work in the construction industry, for retail stores catering to home renovations or for industrial plants with specialized applications.

Main Duties

Even though these trades are diverse, all of these workers prepare surfaces for the application of specialized building materials. They know the techniques for handling their specialized products, and they practise safety procedures in applying these products. In some cases, they estimate the materials needed and the cost of the installation from plans or project specifications. They may have to assess existing conditions to determine what costs and materials can be saved and what structures need to be replaced. They learn to use the specific tools of their particular trade.

Roofers build or repair both flat roofs, using hot asphalt, gravel and waterproof sheet materials, and sloped roofs, using asphalt and wood shingles, shakes and masonry or baked clay roofing tiles and metal materials. They also install sheet metal flashings and apply waterproof coatings to concrete or other masonry surfaces below or above ground level.

Shinglers install or replace shingles, roof tiles and similar coverings. They also set up scaffolding to provide safe access to roofs.

©Stone/Vancouver

Glaziers install glass in buildings and on exterior walls of buildings. Glaziers' skills are also used in manufacturing furniture, display cabinets, bathroom fixtures and decorative windows. They also replace windows and windshields in vehicles, install skylights and install special glass in churches, museums and other establishments.

Insulators apply insulation to plumbing, heating, cooling and refrigeration systems, piping equipment and pressure vessels, as well as to walls, floors and ceilings of buildings and other structures. This reduces the passage of heat, cold, sound or fire. They install vapour barriers and brush waterproofing products over insulating materials. They also remove asbestos and urea-formaldehyde insulation from buildings.

Painters and *decorators* apply paint, wallpaper, fabric and other finishes to interior and exterior surfaces of buildings and other structures. They also repair cracks and holes in walls and prepare work surfaces by scraping, sanding, sand-blasting, hydro-blasting and steam-cleaning.

Floor covering installers install carpet, wood, linoleum, vinyl and other resilient floor coverings in residential, commercial, industrial and institutional buildings.

Example Titles

roofers and shinglers (7291):
- apprentice roofer
- apprentice residential steep roofer
- asphalt roofer
- built-up roofer
- roofer
- shingler

glaziers (7292):
- apprentice glazier
- apprentice automotive glass technician
- auto glass glazier
- plate glass installer

- structural glass glazier

insulators (7293):

- apprentice heat and frost insulator
- boiler and pipe insulator
- heat and frost insulator
- insulation applicator
- insulator
- sound insulator
- fire insulator

painters and decorators (7294):

- construction painter
- apprentice painter and decorator
- painter and decorator
- paperhanger

floor covering installers (7295):

- apprentice floor covering installer
- apprentice hardwood floorlayer
- carpet layer
- floor covering installer
- vinyl floor installer

Education and Training

To work as a *roofer* in B.C., it is compulsory to be certified in the trade or to be registered in a three-year apprenticeship that will lead to qualification. Roofer apprentices complete three in-school training sessions of four weeks each, delivered through the Roofing Contractors Association of British Columbia in Surrey.

Although certification is not required to work as a *painter* and *decorator* or *floor covering installer*, three-year apprenticeships are available. Painter and decorator apprentices are required to attend three in-school training sessions for five weeks each, delivered through the Painting Industry Joint Trade Board. Although it is not required for entry into or completion of an apprenticeship, British Columbia Institute of Technology (BCIT) offers a 20-week Painting and Decorating Certificate Program. Kwantlen University College trains floor covering apprentices with three sessions for five weeks each.

Glaziers or *heat and frost insulators* may complete a four-year apprenticeship. Heat and frost insulator apprentices must fulfil four sessions of four weeks each of required in-school studies, while glazier apprentices must complete three sessions of six weeks each. Apprenticeship training programs are provided through BCIT.

Completion of an entry-level training program may confer credit toward some of the required technical training. The Industry Training and Apprenticeship Commission (ITAC) recommended education prior to entering an apprenticeship program is grade 12 or equivalent, with appropriate English, mathematics and science courses.

Upon completion of these apprenticeships, an apprentice must pass an interprovincial standards examination to receive a Certificate of Qualification with an interprovincial Red Seal endorsement. (With additional experience and completion of another exam, painters and decorators can receive an Industrial Painter endorsement on their Certificate of Qualification.)

For people who have worked for a long time in one of these trades but have never completed an apprenticeship, a Certificate of Qualification is available. The certificate is awarded following submission of evidence of four-and-a-half years (painters and decorators, floor covering installers) or six years (glaziers, heat and frost insulators) of full-time experience in the trade and successful completion of an exam. This option is not available to roofers, who must complete an apprenticeship.

Current details regarding these apprenticeships can be obtained by contacting an ITAC local area office.

Due to the physical nature of these trades, workers in this occupational group should be in good physical condition and have manual dexterity. Those working on commercial buildings must be prepared to work at heights. Painters and decorators should be able to determine the quantities of materials needed and have creative skills, including a good sense of colour and an ability to visualize a finished product. Glaziers who want to work with stained glass need artistic skills as well. Insulators must be able to read and interpret drawings and specifications and to analyse, measure and cut materials accurately.

Working Conditions

To perform in the construction industry, workers generally have to be strong and healthy. They have to work in difficult conditions. For example, *roofers* work in high places, *glaziers* are required to work from scaffolds to manoeuvre glass panels lifted to them by cranes, *insulators* work in confined conditions with dangerous substances, and *painters* often work in crouched positions or over their heads. In all cases, they have to work carefully and pay attention to detail. A typical work week is 35 to 40 hours, but weekend and evening work, as well as overtime, are common in order to complete construction projects on time.

The earnings for these workers are below the workforce average. The average worker in this occupational group earned $19,500 in 1995, while those who worked full time, full year earned $29,200. For the workforce overall in 1995, the average worker earned $27,900, and workers who worked full time for the whole year averaged $39,400.

Unionized workers earn wages that are higher than the average for the workforce as a whole. It should be remembered, however, that many workers in these occupations are not union workers.

This is a very large occupational group. In 1998 about 13,680 people worked in these occupations. This is an increase from the 12,250 who worked in these trades in 1990. Painters make up 46% of these workers. Roofers constitute 21% of the group, floor covering installers 16%, glaziers 10% and insulators about 6%.

There are many opportunities for both self-employment and part-time work. In these trades, 33% of the workers are self-employed, which is higher than the average for the overall workforce (15%). Painters (40%) and floor covering installers (51%) have the most opportunities for self-employment. A slightly smaller than average share of this group work part time, though it is still a significant group of workers (25%). The all-occupation rate for part-time employment in B.C. is 26%. These workers can sell their services directly to consumers. Glaziers and insulators have the least opportunities for self-employment or part-time work.

Of the 75% of workers employed full time, only 29% work full time for the whole year. This lack of full employment is reflected in the average annual earnings.

The unemployment rate for these trades is double the provincial average. All of the trades, except floor covering installers (9%) and glaziers (10%), have unemployment rates greater than the average for the overall workforce.

Because most of these tradespeople work in the construction industry, their work is affected by both business cycles and weather. Much of the work is done outside. Even inside work is affected by the decreased activity in the industry during the winter months. Because of this, construction workers must be mobile, ready to go where the work is, and they must be prepared for temporary layoffs during slow periods. This is of particular concern to apprentices, because those completing apprenticeships tend to work for shorter periods during the year and have lower annual earnings. Because some glaziers work in factories, their work is less seasonal than the other trades.

The construction industry employs about 80% of these workers. Retail trade employs an additional 5% of them. These workers apply or install products purchased from retail stores (for example, carpeting or roofing).

These workers are distributed in roughly the same proportions as the total workforce. The Lower Mainland is home to 57%, Vancouver Island has 19%, the Okanagan/Kootenay region has about 17%, and approximately 7% are in Northern B.C.

There is a growing number of women in this occupational group, although their share of the work in this field is still extremely low. About 7% of the workers in this group are women, and they tend to be younger than their male counterparts. Just under 22% of these women are in the 15 to 24 age group. The average earnings for women in this group reflect both their youth and their inexperience, with $11,400 on average and $19,400 for full-time, full-year work.

For the group as a whole, there is a noticeable concentration of those workers (78%) under the age of 45. The average age of these workers is 36, which is younger than the average for the provincial workforce (38). Because of the physical strength required for the work and the lower wages, younger workers will continue to dominate these trades.

Employment Prospects

This is a very large occupational group consisting of several distinct construction finishing trades occupations. Employment for the whole group *other construction trades* is projected to grow more slowly than the average for all occupations from 1998 to 2008 according to the Canadian Occupational Projection System (COPS). Despite the slow growth, there still will be a large number of employment openings over this period because this is a very large occupational group and many workers are expected to retire. COPS projects that there will be a total of 3,840 openings, including new and replacement jobs. Almost three-quarters of these openings will result from workers retiring, comprising 2,310 job openings. The remaining 1,530 openings will be newly created jobs.

Within this group, *painters* and *decorators* make up about half of the workers and are expected to have about 47% or 1,800 of the job openings. The next largest group are *roofers* and *shinglers* who will have 24% or 930 of the job openings. Combined, these two occupations make up two-thirds of the workers in the construction finishing trades.

Floor covering installers, glaziers and *insulators* make up the remaining third of the group. There are expected to be a total of 520 openings for floor covering installers, 340 openings for glaziers and about 240 openings for insulators over the period 1998 to 2008. Employment in all these fields of work is very sensitive to overall economic conditions and is highly seasonal.

Construction is the major industry of employment for workers in this occupational group. The construction industry in B.C. grew rapidly from 1986 to 1995. However, between 1996 and 1999 construction activity declined due to weaker population growth, slower economic growth and weaker labour markets. Since then, non-residential construction activity has remained relatively stable, but residential housing construction has dropped from its 1994 peak. Low levels of residential construction have created much pent-up demand for housing. The construction industry is expected to grow at the rate of 1.6% per year between 1998 and 2008, which is the same rate as the provincial average for all industries. Industry sources expect higher than average levels of residential construction and thus increased employment growth over the short term. Repairs to leaky condominiums that were built in the 1980s and 1990s will also create work in the near future for construction workers.

Construction generally is sensitive to factors such as interest rates and material costs. Population growth and an aging population are also factors that directly affect residential construction activity. Seniors staying longer in their homes, divorce and young people expecting to form their own households are part of the changing demographics and lifestyle changes that are affecting both the quantity and mix of housing that buyers can afford or want. Many contractors and construction tradespersons rely on this residential building activity to generate business.

The construction industry is recovering from the commercial building boom in the early 1990s. Current shortages of high-end office space will stimulate the market for commercial construction once again. Planning and construction of new hotels has recently started to pick up and is driven by the continued popularity of B.C. as a holiday destination for tourists.

Public sector funding for capital projects has been an important source of construction employment. Since the cancellation of the 1997/1998 public institutional construction freeze, there has been a flurry of school construction. The main focus of other construction expenditures will be in the transportation infrastructure of the province, which includes road and bridge construction and a planned extension of the Sky Train in the Lower Mainland.

Productivity gains through new materials, processes and other new technologies are reducing the need for tradespeople. As a result, increasing construction activity may not result in increases in as many jobs as in previous years.

Because the construction industry employs such a large number of workers, there will be a significant number of openings in the long term, especially to replace an aging workforce. In the short term, there will be considerable competition for positions, and new workers will be competing with experienced workers for the available jobs. However, there may be a shortage of apprentices entering the construction industry over the long term.

Fifty percent of all residential home construction in B.C. is in renovation work compared to 70% nationally. Some older buildings are being converted to apartments and condominiums, and some homeowners are renovating their homes rather than purchasing newer or bigger houses. While in some cases the homeowner takes on this renovation as a do-it-yourself project, in many other cases this work is done by self-employed or small business tradespersons, which provides work opportunities for roofers, insulators, painters and floor covering installers.

Direct contact with potential employers is often the best source of employment opportunities. As with many apprenticeable trades, apprentices are often chosen from the ranks of a company's current employees, such as construction labourers. Red Seal certification in trades means workers are qualified to work in any of the provinces or territories. In these occupations, tradespeople can advance to supervisory positions or start their own businesses.

Additional Information

Roofing Contractors Association of B.C.
http://www.rcabc.org

Industry Training and Apprenticeship Commission
http://www.itac.gov.bc.ca

Related Occupations

- glass forming and finishing machine operators and glass cutters (in 941 machine operators in metal and mineral production processing)
- painters and coaters, manufacturing (in 949 other assembly and related occupations)
- interior decorator (in 6421 retail salespersons)
- contractors and supervisors, trades (721)

Machinery and Transportation Equipment Mechanics (except Motor Vehicle)

NOC 731

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	15,660	18,260	20,270

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
2,010	3,390	5,400

Annual Growth 1998-2008	1.0%
Main Industries of Employment	
Wood Manufacturing	14%
Wholesale Trade	12%
Construction	12%
Employment by Region	
Lower Mainland	41%
Vancouver Island	16%
Northern B.C.	21%
Okanagan/Kootenay	22%
Self-employment	7%

Nature of the Work

This group includes workers who install, maintain, repair and overhaul engines, hydraulic and mechanical systems, and other machinery. Work typically consists of taking equipment apart, checking it and diagnosing problems, aligning the machinery, and fitting or machining new parts. Some workers in this group (such as *construction millwrights*) are also responsible for original construction and installations of equipment, and some (such as *aircraft maintenance engineers*) also must rigorously check and inspect equipment to make sure hazards are prevented. With over 18,000 workers in British Columbia, this is a very large occupational category.

Work takes place in a range of industrial settings, such as plants, and in mining and logging sites. *Air-conditioning* and *elevator mechanics* may work in any large commercial, industrial or residential building, and *transportation equipment workers* work in airports or repair yards, or sometimes in the field. These workers are employed by manufacturing, mining, logging, transportation and construction companies. They may also work for companies that build and sell the equipment, or they may be self-employed. This group also includes apprentices for these occupations.

Main Duties

Each trade or specialty in this group will have specific duties that are different from all others, but there are similarities in some of the types of tasks. They must all be able to work from plans and blueprints. They must be able to install the equipment and align parts or components of the equipment, using hand or power tools or hoisting equipment if necessary. They must also test and examine equipment to ensure that safety and quality standards are met.

Machine fitters fit and assemble prefabricated metal parts to build heavy industrial machinery and transportation equipment, including aircraft engines.

Elevator constructors and *mechanics* assemble, install, maintain and repair freight and passenger elevators, escalators, moving walkways, dumbwaiters and other related equipment.

Millwrights and *mechanics* may specialize in either installation or maintenance, though they usually do both. When equipment is already in place, these workers perform routine maintenance, such as cleaning and lubricating or adjusting valves and seals. They inspect and examine the equipment to find and investigate problems and breakdowns. Specialized duties for millwrights include using grinders and lathes to make customized parts and constructing the foundations to set the machinery on.

Refrigeration and *air-conditioning mechanics* install, maintain, repair and overhaul residential, commercial and industrial central air conditioning systems. They measure and cut piping and connect piping using welding and brazing equipment. They also recharge systems with refrigerant gases. They must be able to use and adjust computerized controls and use computer software to calculate loads. As they can be self-employed or work for contractors, they may need to prepare work estimates for clients.

Transportation equipment mechanics include aircraft mechanics, heavy-duty equipment mechanics and railway carmen/women. Their jobs involve repairing and maintaining mobile equipment, such as airplanes and helicopters, industrial and construction vehicles (such as bulldozers or mining trucks) and heavy-duty equipment used in construction, forestry, material handling, landscaping and land clearing, and repair and maintenance of railway cars. This includes troubleshooting structural, mechanical or hydraulic systems to identify problems. They also must be able to repair and overhaul equipment systems according to manufacturers' specifications and established procedures. Other responsibilities include testing repaired equipment for proper performance, cleaning and lubricating equipment, and other routine maintenance work. Railway carworkers are also responsible for the interior of cars, which includes repairing and repainting wooden fixtures and repairing damaged windows and upholstery.

Aircraft maintenance engineers (aircraft inspectors) inspect aircraft and aircraft systems following manufacture, modification, maintenance, repair or overhaul to make sure they meet Transport Canada standards of performance and safety.

Example Titles

construction millwright (7311):
- apprentice marine engine mechanic
- construction millwright
- fixer, textile machinery

©Stone/Vancouver

- industrial mechanic
- maintenance millwright
- apprentice millwright
- millwright
- plant equipment mechanic
- textile mechanic and repairer
- treatment plant mechanic

heavy duty equipment mechanic (7312):
- construction equipment mechanic
- apprentice diesel engine mechanic
- apprentice diesel fuel injection mechanic
- diesel mechanic, heavy equipment
- diesel technician
- apprentice farm equipment mechanic
- farm equipment mechanic
- apprentice forklift mechanic
- apprentice heavy duty equipment mechanic
- heavy duty equipment mechanic
- heavy equipment mechanic
- heavy equipment mechanic apprentice
- heavy mobile logging/mining equipment mechanic
- tractor mechanic

refrigeration and air-conditioning mechanic (7313):
- commercial air-conditioning mechanic
- heating and cooling mechanic
- apprentice refrigeration mechanic
- apprentice transportation refrigeration mechanic

- refrigeration and air-conditioning mechanic
- refrigeration mechanic

railway carman/woman (7314):

- carman/woman
- carworker
- railcar mechanic
- apprentice railcar mechanic
- railway carman/woman
- railway carman/woman apprentice

aircraft mechanic and inspector (7315):

- apprentice aircraft maintenance technician
- apprentice aircraft structural technician
- aircraft maintenance engineer
- aircraft inspector
- aircraft mechanic
- aircraft mechanic, engine overhaul
- aircraft systems inspector
- certified aircraft technician
- apprentice hydraulic service mechanic
- hydraulic mechanic
- inspector, flight test
- mechanic, aircraft maintenance
- shop inspector, aircraft repair

machine fitter (7316):

- aircraft engine fitter
- assembly fitter
- heavy equipment fitter
- apprentice machine fitter
- machine fitter
- mechanical fitter

elevator constructor and mechanic (7318):

- escalator repairer
- elevator constructor and mechanic
- apprentice elevator mechanic

Education and Training

Most of the occupations in this category have apprenticeships, although it is not necessary to complete an apprenticeship or to be registered as an apprentice to work in these fields. However, it is compulsory to complete an apprenticeship and receive a Certification of Qualification to be a *refrigeration mechanic*. Most of these apprenticeships are four years long. *Transport refrigeration mechanics (commercial transport refrigeration mechanics)* usually complete a three-year apprenticeship. The Industry Training and Apprenticeship Commission (ITAC) recommends that apprenticeship prerequisite education is grade 12 or equivalent, with appropriate English, mathematics and science courses.

Most of these apprenticeships involve several weeks of technical training each year at a B.C. college, university college, technical institute or training school. However, *aircraft maintenance technician* apprentices must travel to Manitoba or complete the technical schooling by correspondence. Transport refrigeration mechanics travel to the Southern Alberta Institute of Technology for training.

Many occupations with apprenticeship programs are also certifiable. Certification consists of passing an interprovincial standards examination to receive a Certificate of Qualification. Many of these apprenticed trades that qualify for a Certificate of Qualification are also interprovincial Red Seal endorsed.

People who have worked for a long time in many of these professions but have never completed an apprenticeship may receive a Certificate of Qualification, if applicable. The certificate is awarded following submission of evidence of substantial full-time experience in the trade and successful completion of an exam.

Entry-level training programs in these trades are available at a number of provincial colleges, university colleges and at BCIT, and they may confer credit toward some of the required technical training. As well, there are programs available for those who do not necessarily wish to pursue apprenticeship training. Most B.C. aircraft maintenance technicians are licensed through Transport Canada instead of completing an apprenticeship. Northern Lights College offers an Aircraft Maintenance Engineering Diploma program, and the British Columbia Institute of Technology (BCIT) offers various certificate and diploma programs for aircraft mechanics.

Current details regarding all apprenticeships can be obtained by contacting a local ITAC area office.

All mechanics in these job categories need manual dexterity and good hand-eye coordination. Further, they must be in good physical condition, since heavy lifting and climbing may be required. They must be able to interpret and follow written instructions and blueprints. An understanding of computerized machinery as well as good communication and analysis skills are important. Upgrading to stay abreast of technological change is important for those who wish to succeed. In addition, railway car workers should have an interest in electrical/electronic work, welding and steel fabrication. Aircraft mechanics require good colour vision and hearing. They must not be afraid of heights, as they may work on the top of jet wings and fuselages. Workers must continue to upgrade their skills and education throughout their careers to remain knowledgeable in their field.

Working Conditions

Workers in this group can work under a variety of conditions. Some will work mainly indoors, in repair shops, plants and other buildings, but many will work outside at least part of the time. Workers in some industrial specialties may have to move around or work in remote areas. Logging machinery mechanics, for example, will be required to work outside in all weather, and their worksites are often remote. Shift work is common, especially in plants. Many of these positions are unionized.

Physical strength and dexterity are required for the work of putting together and repairing large machines. Many of those employed in this group work with electronic systems or diagnostic tools. Because machines are constantly being upgraded to take advantage of new technology, workers must be able to stay up-to-date with new developments.

Workers in this occupation have above-average earnings, according to 1995 salary figures. All workers in this group earned an average of $45,000, compared to the all-occupation average of $27,900. Workers employed full time for the full year earned $49,600, compared to the provincial full-time, full-year average of $39,400.

Recent college graduates who found work as *machinery* and *transportation equipment mechanics* reported average monthly salaries of between $2,790 per month for refrigeration mechanics to $3,370 per month for construction millwrights and industrial mechanics. For those who work full time, full year, that will mean annual starting salaries of between $33,500 and $40,400. Note that although these are starting salaries, they are also the wages paid to workers who have invested time in getting up-to-date training.

An experienced, well-qualified air-conditioning mechanic can earn very high wages, according to industry sources. For full-time, full-year work, railway carworkers can expect to earn from about $2,760 per month (or $33,100 per year) at the entry level up to a high of about $44,400 for an experienced, skilled worker.

About 90% employed in this group are in apprenticeable trades. Apprentices' wages are included in these averages but generally fall into the following pattern. A first-year apprentice earns 50 to 55% of a journeyed worker's wage, a second-year apprentice earns 60 to 65%, third-year earns 70 to 75%, and fourth-year earns 80 to 90%.

This is a very large occupational group. In 1998 there were 18,260 people in this occupation in B.C., up from 15,660 in 1990. By far the largest number of workers are millwrights, who make up 40% of this group. The other occupations in this group and their proportions are heavy equipment mechanics 33%, aircraft mechanics and inspectors 13%, refrigeration and air-conditioning mechanics 7%, railway carmen/women 3%, elevator mechanics 2%, and machine fitters 2%.

Overall, only 7% of workers in this group report being self-employed, compared to 15% of the general workforce. However, there are noticeable differences in self-employment levels among the specialties. For example, air-conditioning and refrigeration mechanics report about 20% self-employment, whereas none of the railway carworkers are self-employed.

There is a very high level of full-time work within this category of workers. Overall, about 68% work full time for the full year, and another 27% work full time for part of the year, for a total of over 95% in full-time work. By comparison, 74% of the entire workforce is full time, for either part or all of the year. The unemployment rate for these workers is lower than the provincial average rate.

Some millwrights work during plant construction and during maintenance shutdowns, so they may have a few weeks or months of full-time work in one location, then be required to move to another. Seasonal work is common for those who work for logging and forestry companies. Air-conditioning mechanics also experience seasonal changes in the demand for work, but if they also do other work, such as repairing refrigeration and heating systems, they can minimize winter slowdowns.

Machinery and transportation equipment mechanics are employed across a wide range of industries. The most significant industry for employment is the wood manufacturing industry, which includes, for example, shake and shingle manufacturing, sawmills, and construction elements, such as doors and kitchen cabinets. This industry accounts for 14% of those employed in this occupation. The second largest employer is the wholesale trade sector, employing 12% of these workers. Wholesale trade includes wholesale machinery, equipment and supplies industries. Other important areas for employment include construction, air transport, logging and forestry, and railways. Again, occupations in this group are closely connected to specialties. The rail transport industry, for example, only employs about 5% of this group overall, but that includes 94% of all railway carmen/women.

There are above-average percentages of machinery and transportation equipment mechanics in Northern B.C. and the Okanagan/Kootenay region. Northern B.C. employs 21% of these workers (compared to 10% of the total workforce), and the Okanagan/Kootenay region has 22% (compared to 15% of the total workforce). This is a result of the fact that so many of these workers are employed by organizations that rely on natural resources. The Lower Mainland region accounts for 41%, below its 57% share of the total workforce, and Vancouver Island has 16%, slightly below its 18% share of the whole workforce. This regional representation of workers also varies somewhat according to specialties. A full 65% of the province's aircraft mechanics and inspectors are in the Lower Mainland, as Vancouver is the site of the province's busiest airport. At the other extreme, 26% of construction millwrights are found in Northern B.C., compared to 10% of the total workforce.

Almost all machinery and transportation equipment mechanics in B.C. are men. There are only about 165 women in this occupation, making up less than 1% of these workers.

Compared to other occupations, this group of workers overall is slightly older than the provincial workforce average. There are more workers than average in the 35 to 44 age group and fewer than average in the youngest group, the 15- to 24-year-olds. The average age of these workers is 42, four years higher than the B.C. all-occupation average.

Employment Prospects

This is a very large occupational group, made up of about 18,260 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment in this group to grow at an annual rate of 1.0%, slower than the average for all occupations. According to this projection, 5,400 positions will become available from 1998 to 2008. Over 60% of these openings are projected to come from the need to replace workers who retire, and the remainder will come from growth in the number of new positions.

The low employment growth projected for this occupational group is mainly because of advances in technology and automation, which together will continue to enable employers to do more work with fewer workers. Advances in technology are also causing machinery and transportation equipment to become more reliable, thus reducing maintenance needs.

This occupational group includes a wide variety of *mechanics* who are employed across many different industries. Consequently employment prospects for these occupations vary considerably.

About 40% of all workers in this occupational group are *construction millwrights* and *industrial mechanics*, and employment of these workers is projected to grow more slowly than the all-occupation average. Employment growth for millwrights will be limited due to slower than average growth expected in forestry manufacturing industries. Including openings that will result from the need to replace workers who retire, the COPS projection calls for a total of 1,600 openings to become available. The introduction of computer controlled equipment on production lines is increasing the skill level necessary for these workers to install, maintain and repair this technologically enhanced machinery. Employment growth of these workers will also continue to be affected by major changes in products and equipment.

Heavy duty equipment mechanics account for about 33% of this occupational group. Employment of these workers is projected to grow more than twice as fast as their millwright and industrial mechanic counterparts but still more slowly than the average for all occupations. This projection calls for 1,770 openings. Workers hoping to enter this field may be able to move into full-time jobs and apprenticeships through work-experience placements, part-time work or related junior positions.

Employment of *aircraft mechanics* and *inspectors* is projected to grow faster than the all-occupation average. However, since these workers only make up about 13% of this entire occupational group, this projection amounts to a total of 970 openings over the projection period. Almost three-quarters of these workers are employed in the air transportation industry. The restructuring currently underway in the airline industry is a major source of uncertainty with this forecast. Industry analysts are divided as to whether the restructuring will result in fewer or more being employed. A growing number of helicopters are being used in the logging and forestry sector to enable loggers to cut trees selectively. According to industry sources, this is increasing the demand for workers trained in helicopter maintenance. This specialty does experience some seasonal employment patterns as activities in some areas decrease in winter weather.

Employment of *refrigeration* and *air-conditioning mechanics* is projected to grow much faster than the all-occupation average and faster than any other occupation in this occupational group. However, since these workers only make up about 7% of this entire occupational group, this projection amounts to total of only 690 openings.

The remaining 7% of the workers in this group are either *railway carpersons, machine fitters, textile machinery mechanics* or *elevator constructors*. The combined employment of these workers is projected to grow more slowly than the average for all occupations. This projection calls for a total of 350 openings to become available for positions in these occupations over the projection period.

High competition for openings in these fields will continue to give employers the option of hiring only the most qualified workers. Employers generally prefer to hire individuals with a journeyperson certification. This is especially true in the Lower Mainland area, where, according to industry sources, there is currently a surplus of qualified workers. In other areas where journeypersons are not readily available, employers may take on and train workers with related experience or training. Uncertified *mechanics* in all specialties may have trouble finding work under these conditions. Up-to-date training and flexibility (for example, the addition of welding skills to basic certification) will give job seekers an advantage. For those who are self-employed or seeking self-employment in these occupations, the cost of tools can be a major factor in their ability to gain contracts and work, a factor that often favours those with an extensive array of specialized mechanic tools.

Many companies fill their apprenticeship openings with workers they already employ. In large unionized forestry and wood products firms, workers who have seniority bid on apprenticeship openings. Entry-level positions, such as a labourer or helper with such an employer, can provide a means to enter these apprenticeship positions. Red Seal certification, which is available in many of these trades, allows journeypersons to work in all provinces and territories.

Progression to supervisory positions in these jobs is possible with experience. *Aircraft mechanics* may progress to foreman/woman or shop supervisor. Experience and an AME (aircraft maintenance engineer) licence is necessary to become an *aircraft inspector*. Aircraft inspectors may progress to *shop inspector* and, with additional certification, to inspecting and certifying a broader range of aircraft and aircraft systems.

Additional Information

Industry Training and Apprenticeship Commission
http://www.itac.gov.bc.ca

For *refrigeration and air-conditioning mechanics*
Southern Alberta Institute of Technology
http://www.sait.ab.ca/academic/construction
/apprenticeships/pgm19.htm

For *aircraft mechanics and inspectors*
Transport Canada *http://www.tc.gc.ca*

Canadian Aviation Maintenance Council
http://www.camc.ca

Related Occupations

other occupations related to many or all of the specialties in this group include the following:

- contractors and supervisors, trades (721)
- motor vehicle mechanics (732)
- mechanical, electrical and electronics assemblers (948)

additional related occupations for millwrights:

- industrial instrument technicians and mechanics (2243)

air-conditioning and refrigeration mechanics:

- domestic refrigeration and air-conditioner servicer (in 733 other mechanics)

aircraft mechanics and inspectors:

- aircraft instrument, electrical and avionics mechanics (2244)

machine fitters:

- welders (in 951 welders and related machine operators)

Motor Vehicle Mechanics

NOC 732

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	17,990	20,850	24,670

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
3,820	3,410	7,230

Annual Growth 1998-2008 1.7%

Main Industries of Employment

Retail Trade	77%
Wholesale Trade	7%
Public Transit and Other Transportation	3%

Employment by Region

Lower Mainland	54%
Vancouver Island	15%
Northern B.C.	12%
Okanagan/Kootenay	19%

Self-employment 17%

Nature of the Work

Motor vehicle mechanics and *technicians* diagnose, repair and service mechanical, electrical and electronic systems and components of cars, buses and trucks. *Motor vehicle body repairers* repair and restore damaged motor vehicle body parts and interior finishing.

These workers are employed by motor vehicle dealers, garages and service stations, as well as by automotive specialty shops and retail establishments that have automotive service shops. They may also be self-employed. Apprentices are included in this very large occupational group.

Main Duties

Motor vehicle and *body mechanics* perform different types of repairs, but share some common duties. They examine vehicles to find out what needs to be fixed and to estimate repair costs. For mechanical components, this often involves the use of computerized diagnostic equipment. They repair damage or perform preventive maintenance, inspect the completed work and test that the vehicle's performance meets required standards. They also must be able to communicate with customers about what has been done and why, and advise customers on general vehicle conditions and future repair requirements.

Mechanics work on mechanical and electronic components of automobiles. This includes most vehicle systems, such as fuel, brake, steering and suspension systems, transmission, differentials, drive axles and shafts, emission control and exhaust systems, engines, and electrical, cooling and climate control systems. Some mechanics specialize in one or more of these systems. They also perform scheduled maintenance service, such as oil changes, lubrications and tune-ups. They use hand tools and specialized automotive repair equipment.

Body repairers work on the vehicle's outside structure. They repair and replace doors, front-end body and underbody components. They hammer out dents, buckles and other defects, and remove damaged fenders, panels and grills. They also straighten bent frames, file, grind and sand repaired body surfaces and repaint surfaces, and repair or replace interior components, such as seat frame assembly, carpets and floor board insulation. They make use of hand tools as well as a range of specialty tools, such as cutting torches, soldering equipment, blocks, hammers and spray guns.

Example Titles

mechanics (7321):

- apprentice automotive electrical and tune-up service technician
- apprentice automotive electrical technician
- automotive mechanic
- apprentice automotive service technician
- automotive service technician
- apprentice wheel alignment and brake service technician
- bus mechanic
- car mechanic
- motor vehicle mechanic
- apprentice automatic transmission service technician
- apprentice standard transmission repairer
- transmission mechanic
- apprentice trailer mechanic
- commercial transport vehicle mechanic
- truck mechanic
- tune-up specialist, motor vehicle

body repairers (7322):

- automotive collision repair technician
- autobody mechanic
- automotive body technician
- autobody repairer
- body repairer, motor vehicle
- motor vehicle body technician
- apprentice automotive painting and refinishing technician
- apprentice automotive refinishing prep technician
- painter, motor vehicle repair

©Stone/Vancouver

Education and Training

To work as an *automotive service technician, automotive collision repair technician (motor vehicle body repairer) or automotive painting* and *refinishing technician* in B.C., it is compulsory to be certified in the trade or to be registered in a four-year apprenticeship (automotive service technicians, automotive collision repair technicians) or a two-year apprenticeship (automotive painting and refinishing technicians) that will lead to certification.

While it is not necessary to complete an apprenticeship to work as a *commercial transport vehicle mechanic*, a four-year apprenticeship is available. To work as an *automatic transmission service technician, automotive electrical technician, commercial trailer mechanic* or *automotive electrical* and *tune-up technician*, a three-year apprenticeship is generally completed.

The Industry Training and Apprenticeship Commission (ITAC) recommends grade 12 education or equivalent, with appropriate English, mathematics and science courses, as prerequisite education for apprenticeships.

Most apprenticeships include some amount of in-school technical training, which is available at most colleges, technical institutes or training schools in B.C. Completion of an accredited entry-level program is mandatory before beginning an apprenticeship in commercial transport vehicle mechanics.

Upon completion of an apprenticeship, automotive service technicians, automotive painting and refinishing technicians and automotive collision repair technicians must pass an interprovincial standards examination to receive a Certificate of Apprenticeship and a Certificate of Qualification with an interprovincial Red Seal endorsement. All others in this category receive a Certificate of Apprenticeship upon completion of the apprenticeship.

For people who have worked for a long time as commercial transport vehicle mechanics but have never completed an apprenticeship, a Certificate of Qualification is available. The certificate is awarded following submission of evidence of six years' full-time experience in the trade and successful completion of an exam.

Current details regarding these apprenticeships can be obtained by contacting a local ITAC area office.

Entry-level training programs in these trades are available at most provincial colleges and university colleges and at the British Columbia Institute of Technology (BCIT), and they may confer credit toward some of the required technical training. As well, there are programs available for those who do not necessarily wish to pursue apprenticeship training. As computer systems become more common in automobiles, the demand for people trained in electronic or computer based repair will increase as well as their earning potential. In addition to the many automobile mechanics programs with courses in electrical systems offered in B.C., BCIT has a 20-week Automotive Electronics Technician Certificate program.

Some of the skills required for these workers include physical fitness and strength, manual dexterity and mechanical aptitude. Skills in diagnostics and damage evaluation as well as customer relations are important. An interest in computer and electrical work is helpful. To remain competitive, all these workers require continual upgrading of skills in order to respond to changes in technology.

Working Conditions

Some *automotive repairers* work for large car dealerships or repair shops, while many work in smaller garages or as independents. Working hours are during the day, though overtime or evening work may be expected.

Working conditions can vary. Some shops are large, bright and well-ventilated, while other shops can be less well equipped. Some garages may be cold and drafty. All workers will probably be exposed to noise, vibration, fumes and vehicle emissions, and the work is often dirty. It usually requires good manual dexterity, good observation abilities and a degree of strength. Some shops may require workers to supply their own hand tools.

Much of the work involves electronic equipment and auto systems. According to industry sources, the move to electronic fuel injection has led to more computerized equipment and systems on automobiles. The computerization of this occupation has significantly changed the appearance of some shops and garages as some of these new diagnostic tools replace older equipment. Industry sources suggest that workers in this occupational group will require an aptitude for electronics and/or computers as well as a mechanical aptitude.

Workers in these occupations have close to average earnings, according to 1995 salary figures. The average annual income of this group in 1995 was $29,700, compared to the all-occupation average of $27,900. Workers employed full time for the full year earned $35,400, compared to the provincial average of $39,400. Mechanics have slightly higher average wages than do body repairers. Experienced, well-skilled workers in this group can expect to earn wages above the occupational average.

Hourly wages for workers in this group may range from $16 to $20 in non-union shops to $20 to $25 in union positions.

A recent survey of graduates who found work in these occupations indicated that entry-level body repairers earned on average $2,190 per month (full time) and entry-level mechanics earned $2,290 per month (full time). That means that these new workers could earn between $26,300 and $27,500 for full-time, full-year work. Apprentices earn a percentage of the journeyperson's wages, depending on how long they've been working, and their salaries are included in these averages. In some shops workers are paid according to the "book rate" of the task, which sets a recommended or average amount of time required to do a specific repair.

According to industry sources, experienced, skilled workers can expect to earn in the range of $36,000 to more than $100,000 for a full-time, full-year position. It should be noted that the very high annual earnings suggested by industry sources probably include self-employed workers who may own their own shop and employ others in this trade.

This is a very large occupational group. In 1998 there were 20,850 people in this occupation in B.C., up from 17,990 in 1990. *Motor vehicle mechanics* make up 77% of this group, and *body repairers* represent 23% of the group. Self-employment among these workers is just above the provincial average (15%), with about 17% of mechanics working for themselves and 19% of the body repairers being self-employed. Self-employment rates differ to some extent by region. Workers outside major metropolitan areas are more likely to be self-employed.

There is not much part-time work in this occupational group, with only about 10% of this group working part time. The all-occupation rate for part-time employment in B.C. is 27%. Of the others in this group, 63% work full time, for the full year, and 26% work full time for part of the year. The unemployment rate for this group is slightly lower than the provincial average rate.

The demand for work may vary slightly with the seasons. Generally, bad weather means more work, especially for body repairers.

Auto repairers are employed mainly in a few industries. The most significant industry for employment of this group is retail trade (for example, repair shops, car dealers and parts stores), which employs about 77% of these workers. The second largest employer is the wholesale trade industry, employing 7% of the workers. Other workers are employed in small numbers across a range of industries. These workers may find employment in maintaining fleets, such as transit or delivery vehicles.

Workers in this occupational group in B.C. are somewhat less likely than average to live in the province's biggest cities. The Lower Mainland has about 54%, and 6% work in Victoria, slightly lower proportions than the workforce distribution of 57% and 9% for these areas. Of the other workers, 9% are in regions of Vancouver Island other than Victoria, 19% live in the Okanagan/Kootenay region, and 12% are in Northern B.C.

Within this group, less than 2% of jobs are held by women. In addition, women who do work in this field have lower wages. The average salary of women who work full time, full year in this occupational group is only $28,700 per year, whereas the full-time, full-year salary for men in this group is $35,400. Women are also more likely to work part time or part year, and they are two to three times more likely to be unemployed. They also are on average a little younger than their co-workers who are men, with 22% of these women in the 15 to 24 age group. As well, they have less formal education. These are all factors that partly might explain the wage and employment gap.

Compared to other occupations, auto repairers are slightly younger. In this group, 31% of workers are in the 25 to 34 age group, compared to 25% of the workforce overall. The average age of these workers is 37, although women auto repairers are 34 on average.

Employment Prospects

This is a very large occupational group, made up of about 20,850 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment in this group to grow at an annual rate of 1.7%, about as fast as the average for all occupations. According to this projection, 7,230 positions will become available from 1998 to 2008. Over half of these openings are projected to come from growth in the number of new positions, and the remainder will come from the need to replace workers who retire.

A little more than three-quarters of the workers in this occupational group are *motor vehicle mechanics*, and the remainder are *auto body repairers*. Employment in both of these occupations is projected to grow at the same rate (1.7% annually), about as fast as the average for all occupations. However, because of the differences in the size of these two occupations, 5,540 openings are projected for mechanics, and only 1,690 openings are projected to become available for auto body repairers.

Wherever there are vehicles on the road, there is a demand for the services of *mechanics* and *auto body repairers*. Employment growth of these workers is closely related to the growing number of vehicles in B.C each year. Population growth from immigration, and tourism from the U.S. and other provinces each year, contribute to the growing number of vehicles on B.C.'s roads. Other factors are acting to limit employment growth. Advances in technology are increasing the complexity and reliability of newer vehicles. This is expected to continue to increase the skill requirements of mechanics and reduce the average number of repairs on each vehicle. Diagnosing mechanical problems is increasingly being done by electronic-based equipment rather than by relying on the services of mechanics. Advances in technology are also enabling automobile bodies to be repaired by fewer workers. The net effect of all these factors is an expectation for average employment growth in these two occupations.

Industry sources agree that advances in technology are increasing the skill requirements of mechanics. They indicate that this has resulted in a shortage of qualified workers, particularly for workers with specialized training in onboard computers and electronics. Workers who have the aptitude and willingness to learn electrical, electronic or computer based repairs are in high demand.

Advancement to *service manager* or *shop foreperson* is possible with experience. Another possible career path for these workers is to set up an independent business. However, start up costs are becoming quite high because of the increasing use of specialized computerized equipment necessary for the job. Because these workers are needed wherever there are cars on roads, there are opportunities for employment and self-employment almost everywhere in the province. With additional training, it is also possible for *mechanics* to transfer their skills to related occupations, such as a *heavy duty mechanic*.

Additional Information

Industry Training and Apprenticeship Commission
http://www.itac.gov.bc.ca

Related Occupations

- motor vehicle assemblers, inspectors and testers (in 948 mechanical assemblers)
- automotive and mechanical installers and servicers (in 744 other installers and repairers)
- heavy duty equipment mechanics (in 731 machinery and transportation equipment mechanics)
- supervisor of motor vehicle repairers (in 721 contractors and supervisors, trades)

> ***Industry sources agree that advances in technology are increasing the skill requirements of mechanics. They indicate that this has resulted in a shortage of qualified workers.***

Other Mechanics

NOC 733

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	4,140	3,890	4,040

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
150	840	990

Annual Growth 1998-2008 0.4%

Main Industries of Employment	
Retail Trade	35%
Other Service Industries	11%
Railroad and Other Trans. Equipment	11%

Employment by Region	
Lower Mainland	46%
Vancouver Island	24%
Northern B.C.	10%
Okanagan/Kootenay	20%

Self-employment 28%

Nature of the Work

This occupational group includes workers who service and repair heating systems, electric appliances, electrical equipment and transformers, small engines and motorcycles.

These mechanics are employed by electrical and other repair shops, appliance service companies and repair departments of retail and wholesale establishments, motorcycle dealers and companies that install and service heating systems.

This group also includes electrical mechanics, who perform the same sort of work on larger machines, often in industrial or commercial settings. Related apprentices are included in this group.

Main Duties

Generally, workers in this group carry out a range of tasks to test, maintain, service and repair engines and motors. In many cases this requires reading and interpreting drawings, specifications and shop manuals. Mechanics consult with customers to determine problems and also use a range of diagnostic tools and equipment. They prepare and work from estimates and write up accounts. They must be able to explain to customers what has been done and what other maintenance may be needed.

Making repairs involves adjusting, repairing or replacing mechanical or electrical system parts and components using hand tools as well as soldering and brazing equipment. Mechanics also test and adjust repaired systems for proper performance. Increasingly, these repair people use electronic diagnostic equipment and work with electronic components of products.

Oil and *solid fuel heating mechanics* service and perform scheduled maintenance on oil, wood and coal burning furnace systems. Unlike others in this group, they also carry out initial installations of heating equipment and must be able to lay out and assemble new systems, and install and connect control devices, thermostats and other oil burner components to motors and electric power outlets.

Electric appliance servicers work on major appliances, such as refrigerators and microwaves, and small appliances found in the home, such as lawn mowers and power tools. They are also required to use test equipment, such as meters and gauges, to measure resistance, current, voltage and pressure.

Motorcycle mechanics and *other small engine mechanics* test, repair and service motorcycles, scooters, forklifts, all-terrain vehicles, small gasoline engines in snowmobiles and lawn equipment, small marine engines and pumps. Members of this group often have job titles that identify a specialty, such as motorboat mechanic.

Electrical mechanics differ from others in this group in that they usually work on larger engines and systems. They are employed to service electric motors, transformers, switchgears, generators and other equipment used to power machinery in commercial and industrial settings. They do some machining, and they recondition or modify shafts, commutators or other parts. They also wind, assemble and install various types of coils for electric motors or transformers and balance armatures or rotors. Like others in this group, they use welding, brazing and soldering equipment as well as hand tools. Although specialization may occur, workers in this group are expected to be capable of repairing all electrical devices.

Example Titles

oil and solid fuel heating mechanic (7331):
- heating technician
- apprentice oil burner mechanic (residential)
- oil burner mechanic
- oil and solid fuel heating mechanic
- wood burner installer
- oil burner apprentice

electrical appliance servicer (7332):
- apprentice appliance service technician
- appliance service technician
- domestic refrigeration and air-conditioner servicer
- electrical appliance servicer
- refrigerator repairer
- service technician
- vacuum cleaner repairer
- washing machine servicer

electrical mechanics (7333):
- coil winder and repairer
- electric motor repairer
- industrial motor winder repairer
- transformer repairer

motorcycle and related mechanics (7334):
- apprentice motorcycle mechanic
- all-terrain vehicle repairer
- motorcycle mechanic
- snowmobile repairer

other small engine mechanics (7335):
- air-cooled engine mechanic
- apprentice inboard/outboard mechanic
- apprentice marine repair technician
- outboard motor mechanic
- apprentice outdoor power equipment technician
- small engine mechanic
- small equipment repairer
- small equipment mechanic apprentice

Education and Training

A four-year apprenticeship is usually required to work as an *oil burner mechanic, air compressor* and *pneumatic tool mechanic, motorcycle mechanic, outdoor power equipment technician, forklift mechanic, marine engine mechanic, office machine repairer, electrical rewind mechanic* or *appliance service technician* in B.C. In-school technical training, available at many provincial colleges, university colleges or at the British Columbia Institute of Technology (BCIT), is part of the apprenticeship program for all of these occupations, except for oil burner mechanics and office machine repairers. Completion of entry-level training programs at a post secondary institution may confer credit toward some of the required technical training in these trades. The Industry Training and Apprenticeship Commission (ITAC) recommends that individuals complete grade 12 or equivalent education, with appropriate English, mathematics and science courses, prior to entering an apprenticeship.

Individuals who complete an apprenticeship will receive a Certificate of Apprenticeship, with many of these occupations also being eligible for a Certificate of Qualification. A Certificate of Qualification is also available for people who have worked for a long time in these professions but have never completed an apprenticeship. Certificates are awarded following submission of evidence of substantial full-time experience in the trade and successful completion of an exam. It is not necessary to have a Certificate of Qualification to work in these fields, however, most employers require or recommend having it. For more detailed information on certification contact a local ITAC area office.

Provincial post secondary institutions also offer programs for those who do not necessarily wish to pursue apprenticeship training. BCIT offers a 34-week Motorcycle Mechanic Certificate program. Malaspina University College and the University College of the Cariboo offer 10-month technician programs in inboard/outboard marine and small engines. BCIT has a 34-week Inboard/Outboard Mechanic Certificate program. An 8- to 10-month Outdoor Power Equipment Certificate program is offered by Kwantlen University College, and BCIT has a 34-week Power Equipment Mechanic Certificate program. Both Camosun College and Kwantlen University College offer nine-month certificate programs in appliance repair.

Mechanics must be comfortable with computerized and electronic systems and have an ability to diagnose problems and an ability to read schematic diagrams or product manuals. They should be strong and physically fit. Due to the increasing use of electronic components in this area, workers would be well advised to develop some skills in electronics. Customer relations skills are usually necessary.

©Stone/Vancouver

Working Conditions

Workers in this group usually work a 35 to 40 hour week during weekdays. In some cases service calls may take place during evening or weekend hours to accommodate clients who can't be at home during the day. Overtime may be required during busy times.

Some workers in this group work in repair shops and do "bench work" repairs on portable pieces of equipment. Others spend much of their time in clients' homes and probably drive a van or truck that contains an inventory of parts. Some, such as *electrical mechanics*, work in large industrial or commercial buildings, or travel between such sites. Outside work may be necessary, for example, in the maintenance of small pleasure boats. Noise and fumes are common, especially in shop conditions. Some employers may require repairers to wear uniforms.

In many cases, workers are required to repair a wide range of equipment, and models and brands change often. As a result, workers must be able to pick up new information quickly and adapt their existing skills to new situations. Some workers belong to workplace unions.

Workers in this occupational group have earnings that are close to the provincial average. In 1995 these workers averaged an annual income of $28,800, compared to the all-occupation average of $27,900. Workers who were employed full time for the full year earned on average $34,600, slightly below the provincial average of $39,400. However, there is significant variation among the specialties. *Electrical mechanics* earned the highest wages, at $46,000 full time, full year, and *motorcycle mechanics* earned the lowest, at $28,200 for full-time, full-year work.

Recent college graduates who found work in these mechanical trades reported average monthly salaries of between $1,850 and $2,910 per month for full-time work. For those who work for the full year, that translates into annual starting salaries of between $22,200 and $34,900. Again, there is significant variation among the specialties, with, for example, a few well-paid electrical mechanics earning much more than motorcycle mechanics.

In 1998 there were 3,890 people in this occupation in B.C., down from 4,140 in 1990. The biggest specialty within this category is *appliance repairers*, who make up about 32% of the group. The next largest pool of positions comes from the miscellaneous group of *other repairers* (33%), followed by *electrical mechanics* (29%). *Heating mechanics* (6%) and *motorcycle* and *related mechanics* (5%) are much smaller occupations within this group.

Self-employment within this broad category of workers is more common than the workforce average, as the work lends itself to small, independent businesses. Overall, 28% of these workers are self-employed, compared to 15% of the general workforce. Electric appliance repairers have a very high level of self-employment, at 42%, while electrical mechanics have the lowest rate of self-employment, at 7%.

The amount of part-time and part-year work in this group is a little higher than the all-occupation average. For the whole group, about 56% work full time for the full year, and 31% work full time for part of the year. Motorcycle and other related mechanics have a high level of part-year work, at around 41%.

The unemployment rate among this group as a whole is just below the provincial average. Heating mechanics have the highest unemployment rate among these mechanics.

These specialties are subject to seasonal slowdowns, and workers considering these areas might do well to cross-qualify in complementary areas. For example, a motorcycle mechanic might wish to become expert in snow blowers and snowmobiles in locations with cold winters, and heating mechanics might cross-qualify in air-conditioning and refrigeration, although this would mean completing another four- to five-year apprenticeship program.

This occupational group is employed in small numbers across a wide range of industries. The most significant sector for employment of this group is retail trade, which includes department and household furnishing stores and recreational equipment retailers. The retail trade employs 35% of those working in this occupational group. Another

11% fall into the service industry, 11% work in railway and transportation sectors, and the construction industry employs about 8% of these workers. Because workers in this group are useful for fixing and maintaining so many kinds of things, they can be employed directly by large employers in almost any industry.

Geographically, these workers are slightly less likely than average to work in the Lower Mainland (46% compared to 57% of the total workforce). Because many of their clients are private consumers, they don't need to be centred around the business and finance centre of Vancouver. They are overrepresented on Vancouver Island (24%) and in the Okanagan/Kootenay region (20%), and 10% are in Northern B.C. Once again, the specialties within this occupational group may have an impact on one specific set of workers. For instance, heating mechanics are found in exceptionally large numbers on Vancouver Island and in Northern B.C., where many people still heat with oil.

Less than 2% of these workers are women, and 21% of these women work part time, compared to 13% of the men in this group. Just over one-third of these women have full-time, full-year jobs.

The average worker in this occupational group is 42, four years above the all-occupation average of 38.

Employment Prospects

This is a medium-sized occupational group, made up of about 3,890 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment of workers in this group to grow at an annual rate of 0.4%, slower than the average for all occupations. According to this projection, only 150 openings will result from growth in the number of new jobs between 1998 and 2008. However, because of an aging B.C. workforce, particularly for workers in this group, an additional 840 positions are projected to result from the need to replace workers who retire.

The low employment growth projected for this occupational group is mainly because of advances in technology and automation, which together will continue to enable employers to do more work with fewer workers. Advances in technology also are causing heating systems, electric appliances, electrical equipment and transformers, small engines and motorcycles to become more reliable, thus reducing maintenance needs. Further, because many of these items are becoming more affordable, it is becoming more common to replace broken machinery and other equipment rather than to repair these items.

7

This occupational group includes a wide variety of *mechanics* who are employed across many different industries. Consequently employment prospects for these occupations vary considerably.

Workers in the *other small engine* and *equipment mechanics* field account for about 33% of this occupational group. Employment of these workers is projected to grow more slowly than the average for all occupations. A total of 290 positions are projected to become available for these workers over the projection period. A growing demand for recreational equipment and pleasure craft, such as motor boats, will be a source of some employment growth for these workers.

About 32% of all workers in this group are *electric appliance servicers*. Employment of these workers is projected to decline. The 160 openings that are projected to become available will be to replace workers who retire.

Employment of *electrical mechanics* is projected to grow faster than the average for all occupations and faster than any other occupation within this group. Although only 29% of all workers in this group are *electrical mechanics*, 45% of the openings projected for this entire occupational group (450 in total) are for positions in this field.

Very few workers in this group are *oil* and *solid fuel heating mechanics*. A total of only 70 employment openings are projected for these workers. Red Seal certification allows journeypersons in this field to work in all provinces and territories.

Motorcycle and *other related mechanics* make up the smallest proportion of this group. Employment of these workers is projected to decline. A total of only 30 net employment openings will result from the need to replace workers who retire from 1998 to 2008.

Because consumer and industrial products are changing so quickly, the best prospects will be for those workers with up-to-date skills who are comfortable with electronic components and skilled in a variety of areas. It is possible to move up to specialist and management positions with experience. Experienced and qualified *mechanics* in these fields can also open and operate their own repair shops. For those interested in this option, experience and additional training in business management are useful.

Additional Information

Industry Training and Apprenticeship Commission
http://www.itac.gov.bc.ca

For *electrical appliance servicers*
Electronic and Appliance Service Industry
http://www.easi.ca/easi

Related Occupations

- other installers, servicers and repairers (744)
- mechanical, electrical and electronic assemblers (948)
- machinery and transportation equipment mechanics (731)
- contractors and supervisors, trades (721)
- electronic service technicians (2242)

Upholsterers, Tailors, Shoe Repairers, Jewellers and Related Occupations

NOC 734

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	3,080	3,860	4,260

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
400	850	1,250

Annual Growth 1998-2008 1.0%

Main Industries of Employment

Retail Trade	42%
Personal and Household Services	28%
Clothing Manufacturing	11%

Employment by Region

Lower Mainland	68%
Vancouver Island	15%
Northern B.C.	4%
Okanagan/Kootenay	13%

Self-employment 40%

Nature of the Work

This group of workers makes, alters and repairs a variety of consumer goods. *Upholsterers, tailors* and *shoe repairers* work mainly with fabric and leather. *Jewellers* work with precious stones and metals, and *watchmakers* work with a variety of timekeeping devices. Workers in this group are employed in large and small retail shops, retail service companies or wholesale and manufacturing companies. They may also be self-employed.

Main Duties

Tailors, seamstresses, dressmakers and *alterationists* or *fitters* make, repair or alter clothing. *Furriers* specialize in the production, care and repair of natural fur garments, and *milliners* specialize in hats and accessories. *Upholsterers* build or restore upholstered furniture, such as couches and armchairs. *Shoemakers* and *shoe repairers* work with footwear and leather goods, such as purses. *Jewellers* work with metals and precious stones.

Though the material with which they work varies, these workers have many duties in common. Generally, the work is divided into mass production, custom production or repair and alteration.

Mass production takes place in larger manufacturing plants or large production shops. Workers often work on only one part of the item and become very skilled in that part of the work. For example, an upholsterer in a factory may just put in springs, while another just does cushions.

Custom production involves making a product to order for a specific client (for example, a tailored suit or a custom-designed ring). This usually requires that workers deal directly with customers to find out exactly what they want and help them make choices regarding materials, styles, and so on. Custom workers may be required to produce estimates, depending on the job. It is also common, especially with clothing, to consult customers during the production process to make sure that the item fits and that the client likes it. Workers involved in custom production must be skilled at all parts of production and are usually required to have some design knowledge.

Repair and alterations work also involves working closely with customers to find out what needs to be fixed or changed. These workers may have to prepare estimates. In some cases (for example, in chain stores with large volume sales), an alterationist may not deal directly with the customer. Like custom production workers, they need a broad knowledge of the techniques used to make products so that they can fix whatever needs mending. For example, a garment fitter may need to take a jacket apart and then re-cut and re-sew it to adjust the size.

There are many self-employed workers in this group, especially among those who do custom work or repair and alterations. These workers must have the skills necessary to run their small businesses. For example, they will need to recruit clients, market their services, purchase necessary supplies and equipment, and keep financial records.

Clothing workers (tailors, seamstresses, furriers and milliners) cut and sew fabrics. If they are making garments, they lay out patterns, adjust patterns where necessary and may create garments from original patterns or from combined patterns. They use commercial sewing machines, irons and scissors or cutters, and they often sew by hand. The complexity of the work depends on the circumstances of the worker. In a factory, the tasks may be specific and straightforward, whereas a custom tailor will need a broader range of skills. *Tailors, seamstresses* and *fitters* usually alter garments rather than make them from scratch. *Milliners* and *furriers* may work with a variety of materials other than cloth.

Upholsterers usually work with fabric and may sew by hand or use sewing machines and cutters. Those workers involved in custom production and repair, work closely with customers and must be able to take the job from concept to completion. They may work from plans and specifications to lay out, cut and assemble upholstery materials. Upholstery fabrics are attached by sewing, gluing, tacking or stapling. Upholsterers also attach ornamental trim, braids or buttons and may be required to refinish wood surfaces. Work with the foundations of the piece of furniture, such as the frame and springs, requires the use of hand and power tools. Although most of the workers deal with household furniture, some install or repair upholstered surfaces on aircraft, motor vehicles, railway cars, boats and ships.

Shoe repairers and *shoemakers* cut, sew, glue and otherwise repair footwear. Shoe repairers also repair belts, luggage, purses and similar products. They use sewing, buffing and other shoe repair machines, materials and equipment. Custom shoemaking in B.C. is mainly restricted to specialty shoes required for health problems.

Jewellers make and repair precious and semiprecious metal jewellery, such as rings, brooches and pendants. They also set precious and semiprecious stones in jewellery mountings according to specifications, such as size (for example, rings). Experienced jewellers may supervise other jewellers. Specialist gemmologists appraise gemstones and diamonds to differentiate between stones, identify rare specimens and find specific conditions or flaws affecting stone values. Special equipment and tools are required for these tasks.

Watchmakers examine clocks and watches and make repairs or adjustments. This involves cleaning the timepiece, as well as testing, adjusting and regulating the timepiece movements. These workers may also be called on to repair and maintain precise scientific equipment, and experienced watchmakers may supervise other watch repairers.

©Stone/Vancouver

Example Titles

upholsterers (7341):

- apprentice automotive upholsterer
- apprentice upholsterer
- automotive upholsterer
- aircraft upholsterer
- custom upholsterer
- furniture upholsterer
- upholsterer
- upholstery repairer

tailors, dressmakers, furriers and milliners (7342):

- apprentice dressmaker and designer
- alterations dressmaker
- dressmaker
- fitter
- furrier
- milliner
- seamstress
- custom tailor

shoemakers and repairers (7343):

- bootmaker
- orthopaedic shoemaker
- shoemaker
- shoe repairer

jewellers, watch repairers and related occupations (7344):

- apprentice jeweller and goldsmith
- gemmologist
- jeweller
- precious stone setter
- clock repairer
- watchmaker
- watch repairer
- apprentice machinist

Education and Training

Upholsterers may learn their trade in a variety of ways. Those involved in the mass production of furniture are trained on the job for the specific tasks to be done. For custom production, repair and alteration, a broader set of skills is required that may be learned through a formal apprenticeship or on-the-job training. The Industry Training and Apprenticeship Commission (ITAC) recommends grade 12 or equivalent education, with appropriate English, mathematics and science courses prior to starting an apprenticeship. Apprenticeships last four years, and all skills and knowledge are learned from a journeyed upholsterer. Upon successful completion of the apprenticeship, an apprentice receives a Certificate of Apprenticeship.

Learning this trade on the job involves working as a helper for a number of years and taking trade-related courses. Kwantlen University College offers nine-month certificate programs in Furniture Upholstery and Automotive/Industrial Upholstery/Trim. Students learn theory and receive hands-on practice. Grade 10 reading and mathematics skills are required for admission to these programs. Many colleges also offer general upholstery courses periodically through their continuing education departments.

Clothing workers in factories are usually trained on the job and require some secondary education. *Tailors, seamstresses* and *dressmakers* must have a demonstrated ability to sew, style, alter, repair and fit garments, and some employers may require completion of courses in tailoring or dressmaking.

Currently there are no formal tailoring or dressmaking programs provided by public post secondary institutions in B.C. A common way to develop a range of sewing skills is through short courses, practice and interaction with other workers in the profession. Kwantlen University College has a Bachelor of Applied Design in Fashion Design and Technology degree program that provides a unique integrated study of design, production and marketing. Both Kwantlen University College and the University College of the Fraser Valley offer diploma programs in fashion design intended for students who wish to pursue a career in the fashion industry. A well, see the profile Creative Designers and Craftspersons (NOC 524) for details about other related programs.

Community education departments at most public colleges and high schools offer short courses about sewing, designing and fitting. For example, Vancouver Community College offers a certificate program in Fashion Arts, which includes courses on tailoring, couture, pattern making and garment construction. Many fabric stores also provide courses.

It is possible to apprentice as a dressmaker and dress designer in B.C. This apprenticeship is two years long and consists entirely of on-the-job training. Upon completion of an apprenticeship, an apprentice receives a Certificate of Apprenticeship. Local ITAC area offices can provide current detailed information.

To become a skilled *shoemaker* and *repairer* workers must have extensive on-the-job training under the supervision of an experienced shoemaker.

Jewellers, watch repairers and *related occupations* often require completion of a college program or on-the-job training. A four-year jeweller and goldsmith apprenticeship is available and consists entirely of on-the-job training. For more information on this apprenticeship, contact a local ITAC area office. Watch repairers primarily learn on the job.

Vancouver Community College, through its continuing education department, offers the Canadian Gemmological Association's professional two-year part-time diploma program in gemmology. Upon successful completion of this program a student is certified as an internationally recognized gemmologist. Students learn to use refractometers, microscopes, dichroscopes, spectroscopes and polariscopes, and they also learn how to test and identify a comprehensive variety of gemstones.

Vancouver Community College also offers a two-year Jewellery Art and Design diploma program. This program is designed to provide comprehensive training for individuals who wish to develop their skills and understanding of jewellery as an artistic expression and also teaches students about commercial viability. Admission requires grade 12 or equivalent and a portfolio. Graduates are able to set up their own studios or find employment as jewellery designers, gold or silversmiths, stone setters and lapidary stone cutters.

Good vision, manual dexterity and hand-eye coordination are required for these trades. Creativity and an aptitude for design are also important assets, along with strong communications skills and basic computer skills.

Working Conditions

Conditions for this group of workers are quite varied. Some are employed by large stores and manufacturing businesses and work in large workrooms or factories. Others work in smaller workshops with a few co-workers. Still others work in retail stores in a back room. Those who are self-employed may work alone in a small shop. Others may work in a home workshop. Those employed in this group usually work 35 to 40 hours a week during weekdays, although those in retail may work the evenings and weekends. Evening and weekend work may also be necessary during busy times.

Many workers, especially clothing workers, work on a piece-work basis, getting paid for what they complete rather than for hours worked. All of these workers work inside and require well-lit work areas. Work areas can be noisy if many machines are in use. Sewing rooms can be dusty, and shoe repair and upholstery gluing can create unpleasant fumes. These workers must be able to do detailed, precise and sometimes repetitive work. Good (or corrected) eyesight is essential, as is manual dexterity.

Upholsterers are required to spend a lot of time on their feet or bending and crouching, moving around large pieces of furniture. Some lifting may be required. *Shoemakers* often work standing at specialized machines. *Clothing workers* may do some standing and crouching for fittings and pressing, but more often they spend long hours sitting in one position. *Jewellers* and *watchmakers* also spend hours in the same sitting position. Eye strain and sore shoulders and necks are potential hazards of this work. Watchmakers are generally expected to supply their own tools.

This work tends to be solitary, especially for the self-employed and those who work in small shops. Each worker generally completes his or her task independent of others.

Workers in this occupational group have estimated annual earnings below the B.C. all-occupation average, at only $16,000 for all workers in 1995, compared to the B.C. average of $27,900. Workers employed full time for the full year earned $21,300, compared to the all-occupation provincial average of $39,400. Within the specialties, clothing workers earn the least ($18,100 for a full-time, full-year position) and upholsterers the most ($27,900 for a full-time, full-year position). Shoemakers/repairers on average earned $19,700 for a full-time, full-year position, and jewellery workers averaged $22,400 for a full-time, full-year position.

Of course there can be tremendous variation in earnings. A qualified gemmologist, for example, will earn considerably more than the average. Industry sources suggest that while a tailor or dressmaker may start earning between $15,000 to $20,000 for a full year of full-time work, a skilled, experienced worker may earn up to $50,000 a year.

Workers often start at the minimum wage, especially those who work for larger organizations. For tailors, union rates in the Lower Mainland at the end of 1995 ranged from $9 to $16 an hour. Non-union wages ranged from $8 to $14 an hour. For those who are self-employed, or who work on a piece-work basis, earnings are tied to how quickly they can produce and how much their clients are willing to pay. A reputation for quality work and above-average skills in design and production will allow workers to earn above-average salaries.

In 1998 there were 3,860 people in this occupational group in B.C., up from 3,080 in 1990. The biggest group (57%) is the clothing workers. Upholsterers make up 24% of these workers, jewellers and watchmakers account for 11%, and shoe repairers and shoemakers also constitute about 8% of this occupational group.

This field has an unusually high level of self-employment. Compared to 15% of the workforce overall, 40% of these workers report being self-employed. Self-employment is highest among shoemakers and repairers, where one out of every two workers, or 51%, is self-employed. The lowest self-employment rate is found among clothing workers, where 39% are self-employed.

Part-time and/or part-year work is slightly more common in this group than in the workforce overall. Many entry-level positions, especially in the clothing trade, are part time. Self-employed workers may also choose to work less than full time. Overall, 46% of these workers work full time for the whole year. The unemployment rate in this group is about the same as the provincial average rate.

There are conditions that cause this work to be seasonal for some workers. Tailors in a manufacturing setting may be subject to some loss of work during the time between fashion seasons, while factories are getting orders and fabrics in for the next season. Pre-Christmas is generally a busy time for all retail establishments, and they may need to take on extra staff or have staff work more hours for custom orders at that time.

These workers are concentrated in a few industries. The most significant sector for employment of this group is retail trade, which includes clothing, furniture, shoe and jewellery shops. This sector employs 42% of the workers in this occupational group. The second largest employer is the personal and household services industry, employing 28% of these workers. This industry includes shoe repair shops and fur storage and repair shops.

Another 11% of these workers are employed in the manufacturing of clothing, and the rest are employed in other manufacturing industries, ranging from furniture manufacturing to textiles and leather. These industries employ those workers involved in mass production as opposed to custom production or repair. (Note that many workers employed in these manufacturing industries are classified in related occupations, for example, NOC 945, Machine Operators in Fabric and Leather Products Manufacturing.)

Workers in these occupations need access to a large consumer population and therefore are more likely than average to live in the Lower Mainland. Within this group, 68% live in the Lower Mainland, compared to 57% of the workforce overall. This leaves other areas of the province with slightly below-average shares. Vancouver Island has 15%, while 13% live in the Okanagan/Kootenay region, and only 4% live in Northern B.C. Within the specialties, upholsterers are more evenly distributed with a smaller than average share of workers in the Lower Mainland, while tailors (70%) and shoemakers and repairers (71%) are the most likely to live in that area.

There is also a connection between self-employment and region. Vancouver Island, the Okanagan/Kootenay and Northern B.C. all have higher rates of self-employment for this occupational group (56%, 62% and 65% respectively). Because these workers are not near the large urban centres where major employers are headquartered, they may have resorted to self-employment in order to continue working in these occupations. For many self-employed workers in this occupational group, the choice of location and occupation is directly linked to a choice in lifestyle and a preference for rural living over urban living.

A majority of these workers are women. Overall, 61%of this group are women, though proportions change among the specialties. For example, 87% of tailors and clothing workers are women, but only 22% of shoemakers are women.

Compared to the all-occupation average, workers in this group are noticeably older. There are relatively few workers under 35 years of age, 21% instead of the 40% share of the workforce overall. Their average age is 44, six years older than the all-occupation average.

Employment Prospects

This is a medium-sized occupational group, with an estimated 3,860 workers in B.C. in 1998. This group is expected to grow more slowly than the average for all occupations. It is expected that between 1998 and 2008 there will be a total of 1,250 new and replacement openings province-wide in this field. At least until the year 2008, this occupational group is expected to have a higher than average proportion of workers retiring. Replacement jobs are likely to provide almost 70% of the job opportunities in the ten years from 1998 to 2008. There also will be some new jobs created in these fields in response to population growth and favourable economic conditions.

The economy as a whole has an impact on work in these occupational areas. When times are good, people are more likely to purchase new and higher-priced, custom-made products. A weaker economy can, however, be helpful to those who do repairs and alterations. For example, it may be cheaper to re-upholster an old sofa than to buy a new one. Technology also has an impact. Some work, including watch and shoe repair, is negatively affected by changes that put more "disposable" products on the market. On the other hand, there is still a steady demand for workers skilled in these occupations to provide service to consumers who buy upscale products. Free trade has affected the apparel industry, increasing the volume of clothing imported from abroad. This trend decreases the demand for local manufactured clothing and shoes as well as for *tailors, dressmakers, furriers* and *milliners*.

Custom-oriented employers look for tailors and dressmakers with a wide range of tailoring and fitting skills, combined with good customer relations skills. Entry to this type of work is usually as a part-time alterationist for a retail store.

There is some mobility in each of the specialties from, for example, mass production to custom production. Shoe repairers can become shoe makers after gaining experience. There is little mobility between the specialties (for example, a tailor will not have many transferable skills to work as an upholsterer). There is also little mobility within the jewellery group. Gemologists and watchmakers, for example, have very different skills.

With experience, it is possible to move up to specialist and management positions in manufacturing and in large shops. In repair work and custom production, a common way for an experienced worker to advance is to open an independent business. In some cases, this will require an investment in equipment, so those considering self-employment should acquire additional training or experience in business.

Additional Information

Industry Training and Apprenticeship Commission
http://www.itac.gov.bc.ca

For *clothing workers*
Apparel B.C. Association http://www.apparel-bc.org

Apparel Human Resources Council
http://www.apparel-hrc.org

Related Occupations

related classifications for many workers in this category:

- labourers in processing and manufacturing (961)
- machine operators in fabric and leather products manufacturing (945)
- other assembly occupations (949)

tailors and seamstresses:

- fashion designers (in 524 creative designers and craftspersons)

jewellers and watchmakers:

- silversmiths and jewellery artisans (in 524 creative designers)

Custom-oriented employers look for tailors and dressmakers with a wide range of tailoring and fitting skills, combined with good customer relations skills.

Stationary Engineers and Power Station and System Operators

NOC 735

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	1,990	2,230	2,380

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
150	500	650

Annual Growth 1998-2008 0.7%

Main Industries of Employment

Pulp and Paper Manufacturing	21%
Hospitals	18%
Electric Power Utilities	14%

Employment by Region

Lower Mainland	36%
Vancouver Island	24%
Northern B.C.	18%
Okanagan/Kootenay	21%

Self-employment 2%

Nature of the Work

Workers in this occupational group operate and monitor a range of large motors, engines and related control devices that supply and distribute power, heat, refrigeration, and so on, in a range of commercial and industrial settings. They are employed in industrial plants, electric power utilities, and organizations in the public and private sector big enough to have large buildings or complexes. Note that the title "*power engineers*" is more generally used in Canada, whereas Americans are more likely to use the title "*stationary engineers.*"

Main Duties

The specific duties of these workers change from workplace to workplace. Generally, these workers take care of large engines and motors, making sure they are running properly and fixing them when problems occur. They are also responsible for keeping track of machines, through fuel-use logs, repair records, and so on.

There are some differences in the type of work carried out by different members in this occupational group. *Power* or *stationary engineers* operate stationary engines and other equipment such as boilers, turbines, generators and compressors, to provide heat, ventilation, power, and so on, for buildings, industrial plants and other worksites. This may involve hands-on tasks, such as starting up and shutting off equipment, and inspecting and repairing equipment. Increasingly these workers are spending much of their time in control centres monitoring and directing equipment with closed circuit television systems and automated or computerized control systems and switchboards. They only take manual control when necessary to correct a problem. They may be responsible for the design, installation and alteration of systems and system components, such as pressure piping systems. They may also supervise non-destructive testing (NDT) of power plants, refrigeration and building mechanical systems.

Power systems operators and *power station operators* do similar work, specifically related to the generation of electric power. Power systems operators monitor and operate switchboards and related equipment in centres that control the distribution of electrical power in transmission networks. They are responsible for coordinating and scheduling power loads and line voltages to meet demands during daily operations, system outages and repairs. Power station operators operate reactors, turbines, boilers, generators and other equipment in electrical generating stations and substations. They mainly work for power utility companies, but some work in very large industrial facilities.

Example Titles

stationary (power) engineer (7351):

- auxiliary plant operator
- boiler operator
- power engineer
- stationary engineer
- steam plant operator
- power engineer apprentice

power systems and station operator (7352):

- diesel station operator
- distribution control operator
- generating station operator
- power dispatcher
- power station operator
- power systems operator
- apprentice operator/area dispatcher

Education and Training

Power engineers usually require completion of grade 12 or equivalent. On-the-job training plus a distance education program or a college training program in power engineering are also required. In addition, provincial certification according to class (Fourth, Third, Second and First Class) is necessary.

For those with no industry experience who are not employed in the field, the British Columbia Institute of Technology (BCIT) offers a 10-month entry-level general power engineering program, which offers both theoretical and practical preparation for writing the B.C. Ministry of Municipal Affairs examination for an Interprovincial Fourth Class Power Engineer's Certificate of Competency. Admission requirements for this program include completion of grade 12, with grade 11 mathematics skills. For those who have grade 12 mathematics and physics 11, BCIT offers a 10-month technical power engineering program, which also prepares students for the Fourth Class exam. This technical program also serves as the first year of a two-year Power and Process Engineering diploma program. Graduates of this program are prepared to write the B.C. Ministry of Municipal Affairs exam for an Interprovincial Third Class Power Engineer's Certificate of Competency. Through its continuing education department, BCIT offers distance programs in all levels of power engineering certification, including Fourth, Third, Second and First Class.

Northern Lights College offers a one-year Power Engineering and Gas Processing Certificate program that prepares students to write the Fourth Class Power Engineering exam and Part A of the Third Class Power Engineering exam. This program has been tailored specifically to meet the needs of the oil and gas industry in northeastern B.C. The College of New Caledonia also offers a Power Engineering program in which students are prepared to write the Fourth Class Power Engineer's exam. Admission to both these programs requires grade 12 or equivalent.

Occasionally, other public colleges offer programs for those working in industry to prepare for a Fourth Class exam.

Workers in these occupations require manual dexterity, good hand-eye coordination, mechanical aptitude, physical strength and good communications skills. They must also be able to adapt to constant exposure to noise and vibration from operating equipment. In addition, it is important to have analytical skills in order to assess problems. Those with management skills, computer skills and interpersonal skills will have the best chances for advancement.

Working Conditions

Workers in these occupations tend to work in larger organizations in an industrial setting. Control rooms are usually comfortable, but plants and equipment areas tend to be noisy, and there may be some exposure to fumes, grease and dust, as well as hazardous chemicals. Shift work and weekend and holiday work are common. Much of the work requires the use of computerized monitoring and control systems.

Workers in this group have above-average earnings. Those employed in this group earned an average of $49,300 in 1995, compared to the all-occupation average of $27,900. The 75% of workers employed full time for the full year earned $53,000, compared to the provincial average of $39,400. Recent college graduates who found work as power engineers and power station and systems operators reported an average monthly salary of $3,690. For those who work for the full year, that will mean an annual starting salary of about $44,300. Clearly these are well-trained workers, but even so, this is a very good entry-level salary for college graduates.

In 1998 there were 2,230 people in this occupational group in B.C., up from 1,990 in 1990. However, most of this growth was in the power systems operators group, as the number of stationary engineers declined over this period. This group is made up of 78% *power (stationary) engineers* and 22% *power systems* or *power station operators*.

Self-employment among this group is practically non-existent as these workers carry out a specialized function needed within large worksites. Only 2% of these workers report being self-employed, compared to 15% of the workforce overall. There is also a very little part-time work in these occupations, with only about 3% of workers working part time. By comparison, the B.C. all-occupation average for part-time work is 26%. The unemployment rate is also lower than the provincial average rate. There are no general conditions that would cause this work to be seasonal, though workers employed in plants with seasonal patterns (such as fish processing) may be subject to seasonal declines in the availability of work.

Workers in this category are employed across a range of industries, all of which would require people to maintain large facilities. The most significant industry for employment of this group is pulp and paper manufacturing. The pulp and paper industry employs 21% of those working in this occupational group. The second largest employer is hospitals (18%), and the third is the electric power industry, which employs 14% of the workers. More than half the power systems and station operators (59%) work in the electric power industry. Other employers of power engineers include schools, railways, gas utilities and manufacturing industries, such as wood products and food processing.

Because they work in both the manufacturing and the service sector, these workers are employed throughout the province. The concentration in pulp and paper and other wood products industries means an unusually high percentage of these workers (18%) are employed in Northern B.C. Vancouver Island has a slightly higher than average share, at 24%. The Okanagan/Kootenay region also has a higher than average share, at 21%, whereas the Lower Mainland has a share that is significantly lower than the all-occupation average, at 36% compared to the total workforce average of 57%.

Women hold only 2% of these jobs. Compared to the all-occupation average, these workers are slightly older. Their average age is 44, compared to 38 for the workforce as a whole. They also have a higher than average share of workers in the 45 to 54 age group, 34%, compared to the workforce average of 21% for this age group.

Employment Prospects

This is a medium-sized occupational group, made up of about 2,230 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment in this group to grow at an annual rate of 0.7%, slower than the average for all occupations. According to this projection, only 650 positions will become available from 1998 to 2008. Over three-quarters are projected to come from the need to replace workers who retire. The remainder will come from growth in the number of new positions.

There are two occupations included in this occupational group, and employment levels in both are projected to grow at about the same rate. However, about 80% of the workers in this group are *stationary engineers,* and consequently about 80% of the projected openings (510 in total) are for positions in this field. The remaining openings (140 in total) are for power systems and station operators.

This slower than average growth projection reflects the slower than average growth in forestry-related industries and the declining employment in the electric power industry. In addition, as employment in these industries increasingly involves monitoring of automated systems and less hands-on control, the number of workers needed to do the work will probably continue to decline. In some cases, because of automation, the work can now be done by workers with fewer skills than are held by qualified power engineers.

According to industry sources, there is currently a shortage of *power engineers* with upper classifications (first and second class) and a surplus of workers with lower classifications (third and fourth class). Accordingly, competition is considerably higher among workers with lower classifications. The difference in competition between workers of higher and lower classifications is expected to continue. Power engineers have qualifications that are standardized throughout most of Canada (excluding Quebec and the two territories), so qualified workers from outside B.C. often compete for jobs in this province.

Power engineers typically progress through a series of qualification levels as they gain experience. In some companies (for example, in large pulp mills), promotion may occur mainly through internal opportunities. Such companies may recruit apprentices from their own supply of labourers.

Generally, *power station* and *systems operators* can advance with experience as promotion opportunities come up. Power engineers must improve their qualifications in order to advance to senior positions.

Additional Information

International Brotherhood of Electrical Workers
http://www.ibew.org

British Columbia Institute of Technology http://www.bcit.ca

Http://programs.bcit.ca/program.php3
?program=ft_cert_manu_04

Related Occupations

- mechanical engineering technicians (in 223, technical occupations in civil, mechanical and industrial engineering)
- civil, mechanical and electrical engineers (213)
- other engineers (214)

According to industry sources, there is currently a shortage of power engineers with upper classifications (first and second class) and a surplus of workers with lower classifications (third and fourth class).

Train Crew Operating Occupations

NOC 736

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	2,420	2,980	3,290

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
310	270	580

Annual Growth 1998-2008 1.0%

Main Industries of Employment

Rail Transportation	88%
Water Transportation	5%
Public Transit and Other Transportation	4%

Employment by Region

Lower Mainland	35%
Vancouver Island	4%
Northern B.C.	20%
Okanagan/Kootenay	42%

Self-employment 1%

Nature of the Work

Workers in this group work together to operate trains and get them safely to their destinations. *Brakemen* and *women* check braking systems and other equipment before the train leaves and assist conductors during trips. *Engineers* are responsible for moving the trains and running the locomotive engines. *Yard engineers* work in shuttling engines and train cars within the train yards. *Conductors* oversee train crews and administer passenger and freight affairs. Those employed in this occupational group work for railway transport companies and industrial or commercial users of rail transport.

Main Duties

Brakeworkers, engineers and *conductors* make up train crews, with workers in each occupation performing different duties to get the train to its destination. There are some overlapping responsibilities among the three occupations, and engineers and conductors usually have greater responsibilities than brakemen/women. Maintaining good communications is the biggest shared responsibility for a train crew. Before a run, the conductor receives train orders and explains them to the brakemen/women, engineer and other crew members. All members of the train crew must be able to communicate with each other by radio, signals or other means.

The main job of the railway engineer is to operate locomotives to transport passengers and freight on railways. During the run, engineers perform switching operations according to instructions. They also fuel up, inspect and perform routine maintenance on locomotives. Yard engineers do similar work in the train yard, moving engines and cars around, and inspecting and maintaining equipment so that it is ready for trips.

Conductors supervise and coordinate the activities of passenger and freight train crew members (except locomotive engineers) to make sure the train operates according to the schedule, the train orders and the code of operating rules. On passenger trains they collect fares, announce approaching train stops and answer passenger inquiries. On freight trains they are concerned with the goods, keeping track of records and performing other paperwork associated with the freight. On both passenger and freight runs they prepare train run reports.

Brakemen/women are responsible for checking brake and train systems and equipment, such as air conditioning and heating systems, and operating those systems during the run. They set and release hand brakes, connect air brake hoses, and make minor repairs as required. Brakemen observe signals and track conditions and open and close track switches. They also assist the conductor on both passenger and freight runs. On passenger runs this involves working with passengers, helping with luggage and other duties. Yard brake workers or yard helpers carry out similar equipment maintenance work in the train yard, preparing trains for runs.

Example Titles

railway and yard locomotive engineer (7361):

- engineer
- freight railway engineer
- locomotive engineer - railway
- railway hostler
- switch engineer
- yard engineer - railway

railway conductor and brakemen/women (7362):

- conductor
- freight train conductor
- passenger train conductor
- brakeman/woman
- brakeworker
- front-end brakeman/woman
- road freight brakeman/woman
- trail-end brakeman/woman
- yard brake workers

Education and Training

Completion of secondary school is usually required for employment with a railway company. New workers in this field often have a trade certificate or diploma.

Train crew operating occupations are organized in a career ladder. Workers usually begin at the *railway yard worker* level and may advance to *brakeman/woman*. Experience as a brakeman/woman is required before becoming a *conductor*, and experience as conductor is required in order to become a *railway locomotive engineer*. To become a *yard locomotive engineer*, experience as a conductor or railway yard worker may be needed. All training is provided by the employer.

Skills required for these occupations include physical strength, an ability to work with other people as a member of a team and careful attention to safety rules and regulations. Workers must be willing to work shift-work, weekends, evenings and in the outdoors. Reliability is also an important quality for individuals in these occupations.

Working Conditions

Train crew workers work on trains and in train yards. Conditions vary depending on the type of work assigned. *Yard engineers* tend to spend a lot of time outside in all weather conditions. This is true of brakemen/women, but to a lesser extent, since they are inside the train while it's in motion. Conditions for *brakemen/women* and *conductors* are also dependent on whether they work on freight or passenger trains. Passenger trains are generally quite comfortable, but workers have more privacy on freight trains. *Engineers* generally have consistently comfortable working conditions in the locomotive section of the train. Workers on freight and passenger trains are often away from home at night.

Crews on passenger trains must be courteous and helpful to the public. Good colour vision is a requirement for all workers, since they need to read colour signals. Brakeworkers need the physical strength to throw heavy switches or carry "knuckles" (connectors used between train cars).

Working hours can be the biggest disadvantage of this work. Trains run 24 hours a day, 365 days a year. With seniority, workers may get a regular run, but they must work their way up to this point. Most workers start on a part-time, casual basis, being assigned to a "spare board" and taking work when it's available. This may mean that they work on short notice, they work lots of overtime, or they work very little. This is also true of the more senior positions of engineers and conductors, who usually work their way up from related positions, such as brakeworkers. For example, a brakeworker who has earned the qualifications to be an engineer will at first get a few spare shifts as engineer, staying with his regular work for the rest of the time. Promotion and eligibility for work is governed by seniority rights. The work is unionized and governed by collective agreements.

According to 1995 salary figures, workers in these occupations had above-average earnings. Many workers may not earn a full wage while they are gaining seniority. That is, if they still have to work some shifts at a lower classification, that work is at a lower rate of pay. Even so, the average for all workers, including those who worked part time, part year, was more than double the all-occupation average ($27,900), at $56,400. Workers who worked full time for the full year earned $58,600, also well above the provincial average of $39,400.

In 1998 there were 2,980 people in these occupations in B.C., up from 2,420 in 1990. Self-employment among this group is not possible practically because of the nature of the rail transport industry. There are very few part-time workers in this group. Only 2% of workers work part time, compared to 26% of the B.C. workforce. Most workers who have the seniority to fill these positions will be able to get enough shifts for full-time work, even though they may not always be in the most senior occupation for which they are eligible.

This occupational group is split almost evenly, with 55% of the workers being engineers and 45% conductors and brakemen/women.

The unemployment rate among train crew workers is also lower than the provincial average. There are no general conditions that would cause this work to be seasonal.

These workers are employed almost entirely by the rail transport industry (88%). About 5%, mostly engineers, work in water transportation, and roughly 4% of the group is in public transit or other transportation industries.

Geographically, train crew workers are most likely to live in the Okanagan/Kootenay region, where 42% of this group are found. There is also an abundance of work in Northern B.C. (20%). On average, 15% of the province's workers are found in the Okanagan/Kootenay, and 10% are in Northern B.C. Of the rest, 35% work in the Lower Mainland region, and about 3% are employed on Vancouver Island.

Fewer than 2% of workers in this occupational group are women, and 88% of them work in the railway industry. The women tend to be somewhat younger, with an average age of 35, than their male co-workers. Compared to the all-occupation average, these workers (men and women combined) are slightly older. Their average age is 43 (the workforce average age is 38). There are almost no workers in the youngest group, those under 25, which is not surprising, since seniority is required to work as a conductor or engineer.

Employment Prospects

This is a medium-sized occupational group, made up of about 2,980 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment in this group to grow at an annual rate of 1.0%, slower than the average for all occupations. According to this projection, only 580 positions will become available from 1998 to 2008. A little over half of these openings are projected to come from growth in the number of new positions, with the remainder to come from the need to replace workers who retire.

There are two occupations included in this occupational group, *railway* and *yard locomotive engineers* (55% of the total) and *railway conductors* and *brakepersons* (45% of the total). Employment in both of these occupations is projected to grow at about the same rate.

There is some uncertainty with the employment forecasts for these occupations because of the uncertainty in the railway industry. Industry experts expect that there will be a major trend toward North American transcontinental rail systems in next few years when a U.S. regulatory moratorium on rail company mergers expires in 2002. After the expiry of the moratorium, it is expected that railway companies will merge, and these mergers could result in significant staff lay-offs. This downsizing is expected to help increase the efficiency of the industry, reducing the costs of shipping and opening up opportunities for shippers. This may contribute to an increase in the demand for rail transportation over the longer run and consequently may help reverse expected employment losses.

Promotion within this group is strictly determined by seniority. Virtually the only way to become an engineer or conductor is to advance from less senior jobs, such as a *brakeperson*. Workers looking for promotion should also get extra training, which is usually offered through the employer.

Mobility between railway transport companies may be limited due to the seniority provisions of collective agreements. Usually, moving from one union local to another results in a loss of seniority.

Experienced engineers and conductors may move into a lead position, such as *trainmaster*, or eventually into management positions with their company. However, with limited growth projected, there will be fewer promotion opportunities.

Additional Information

For *engineers*
Brotherhood of Locomotive Engineers
http://www.ble.org/canada/index.html

Related Occupations

- railway labourers (in 76 construction and other labourers)
- railway yard workers (in 743 other transport equipment operators)
- supervisors, railway transport operations (in 722 supervisors, railway and motor transportation)

Promotion within this group is strictly determined by seniority. Virtually the only way to become an engineer or conductor is to advance from less senior jobs, such as a brakeperson. Workers looking for promotion should also get extra training, which is usually offered through the employer.

Crane Operators

NOC 7371

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	1,340	1,270	1,410

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
140	320	460

Annual Growth 1998-2008	1.1%

Main Industries of Employment

Construction	36%
Non-Ferrous Manufacturing	12%
Wood Manufacturing	8%

Employment by Region

Lower Mainland	48%
Vancouver Island	19%
Northern B.C.	16%
Okanagan/Kootenay	17%

Self-employment	5%

Nature of the Work

Crane operators operate cranes or draglines to lift, move or position machinery, equipment and other large objects. They do this work at construction or industrial sites, ports, railway yards and similar locations. They are employed by construction, industrial, cargo handling and railway companies. Crane operator apprentices are included in this group.

Main Duties

Crane operators operate mobile and tower cranes to lift, move, position or place equipment and materials. The nature of the worksite determines their specific duties. At construction sites, they operate pile driving cranes to drive pilings into the ground to provide support for buildings and other structures. They also operate cranes equipped with dredging attachments to dredge waterways and other areas and operate gantry cranes to load and unload ship cargo at port side. In railway yards, they operate locomotive cranes to move objects and materials.

In industrial settings, crane operators use bridge or overhead cranes to lift, move and place plant machinery and materials. They also work moving materials and equipment using cranes mounted on boats or barges. All crane operators are also expected to do routine maintenance work, such as cleaning and lubricating cranes. Their job titles usually reflect the specific type of work they do (for example, construction crane operator or gantry crane operator).

Example Titles

- boom truck crane operator
- bridge crane operator
- climbing crane operator
- construction crane operator
- crane operator

- dragline crane operator
- gantry crane operator
- hoisting equipment operator
- apprentice hydraulic crane operator
- apprentice mobile crane operator, construction industry
- mobile crane operator
- apprentice tower crane operator
- tower crane operator
- tractor crane operator
- apprentice piledriver and bridge worker

©Stone/Vancouver

Education and Training

To work as a *mobile crane operator* in the construction industry, individuals require college or industry courses in crane operating or completion of a three-year apprenticeship. Upon successful completion of on-the-job training and 16 weeks of in-school technical training, apprentices must pass an interprovincial standards exam before being issued a Certificate of Qualification with an interprovincial Red Seal endorsement. The Industry Training and Apprenticeship Commission (ITAC) recommended education prior to entering an apprenticeship is grade 12, with appropriate English, mathematics and science courses. Mobile crane operators may require a provincial licence to drive mobile cranes on public roads.

Those who have worked as a mobile crane operator for a minimum of four-and-a-half years may be eligible to write a trade examination, and upon successful completion, they are issued a Certificate of Qualification with the interprovincial Red Seal endorsement for the trade.

Boom Truck Operator Class A Trade apprenticeships require three years of on-the-job training, and *Boom Truck Operator Class B Trade* apprenticeships need two years of on-the-job training in order to be eligible to receive a Certificate of Qualification.

There are no formal apprenticeship programs available for *hydraulic* and *tower crane operators*. However, hydraulic crane operators are eligible for a Certificate of Qualification after four-and-one-half years of on-the-job training. Tower crane operator professions are eligible for this designation after three years of on-the-job training. Details about these certifications are available from a local ITAC area office.

Workers in these occupations need to be alert and have a good sense of balance as well as good eye-hand-foot coordination and physical strength. Reasoning and problem-solving abilities are important as are good communication skills. Mechanical skills and an understanding of computerized machinery are an asset, and these workers should also have a willingness to update skills and acquire new knowledge. Attention to safety procedures is very important.

Working Conditions

Workers in this occupation tend to work outdoors, in the types of workplaces described above. Some work may be inside large plants. Hours of work are usually 35 to 40 hours a week on weekdays, though overtime may be necessary. In some cases, as in the case of those working in mining and logging, worksites may be remote.

Workers in this occupation have above-average earnings, according to 1995 salary figures. Workers in this group, including those who worked part time or part year, earned an estimated average of $42,000, compared to the all-occupation average of $27,900. Workers employed full time for the full year earned $47,600, compared to the provincial average of $39,400.

In 1998 there were 1,270 people in this occupation in B.C., down from 1,340 in 1990. Only 5% of *crane operators* report being self-employed, compared to 15% of the workforce overall. Other trades in construction commonly have higher self-employment levels.

There are very few part-time workers in this occupation as well, at only 6%. However, quite a few workers are employed full time for part of the year, which suggests some seasonal work. Again, this is common in the construction trade, which is one of the major sources of employment for crane operators. Construction activity generally decreases during the winter. Workers may be able to make up for seasonal variations by filling in with work in transportation and manufacturing. Workers may also be able to find projects in more than one industry and increase their prospects for work that way.

The unemployment rate among crane operators is slightly higher than average, which is common in occupations that are affected by seasonal influences.

Crane operators are employed across a range of industries that require large objects to be moved. The most significant industry for employment of this group is construction. This industry employs about 36% of workers in this occupation. The manufacturing industry employs 12% of the workers, and wood manufacturing employs about 8%. Other crane operators are employed in water transportation, wholesale trade, rail and other transport and service industries.

Geographically, crane operators are distributed in proportions that reflect the industries that employ them. Northern B.C., with its strong connection to the railway industry and large industrial projects, has more than the average share of these workers with 16%, compared to 10% of the total workforce. The Lower Mainland has 48%, the Okanagan/Kootenay has 17%, and Vancouver Island has 19% of these workers.

Less than 1% of workers in this occupation are women.

Compared to the all-occupation average, crane operators overall are somewhat older. Their average age is 43, compared to the provincial workforce average age of 38. There are very few workers in the youngest age group, the under-25-year-olds, and 34% are between 35 and 44 years old (on average, only 28% of the B.C. workforce falls into this age range). The most noticeable difference in age variance is in the 55 to 64 age group. This occupation has 17% of its workers in this age group, compared to 9% for the total workforce.

Employment Prospects

This is a small occupational group, made up of about 1,270 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment in this group to grow at an annual rate of 1.1%, more slowly than the average for all occupations. According to this projection, 460 positions will become available from 1998 to 2008. About 70% of these positions are projected to come from the need to replace workers who retire, and the remainder is projected to come from growth in the number of new positions. This reflects the high average age (43) of workers in this occupation, 5 years older than the average for all workers in B.C.

Over half of these workers are employed in either the construction, wood manufacturing or non-ferrous manufacturing industry. Although the combined employment of these industries is projected to grow at a rate close to the average for all occupations, other factors will bring the employment growth rate of *crane operators* below the all-occupation average. Within construction much of the growth is forecast within the larger residential component, yet most crane operator work in construction is within the non-residential construction component, which is expected to see more modest growth. Advances in technology are also expected to contribute to limiting the demand for these workers. For example, modern ocean-going container vessels often have automated holds, which make it faster and easier to load, unload and track cargo.

Industry sources suggest that nearly all job openings in this occupation will be from replacing retiring workers and that there will be little, if any, employment growth in this occupation. However, they also indicate that there is a current shortage of qualified workers because of the large number of workers who have recently retired. They predict that this shortage will become considerably more severe as even more workers will soon be at a retirement age and very few younger workers are entering this field.

Employment opportunities are often posted through union locals. Word-of-mouth, newspaper ads and notices through Human Resources (Employment) Centres are other sources of information about available projects and jobs.

Crane operators generally enter the field as apprentices. As technology changes the work, those familiar with new machines and methods will have the best chances of securing work. Red Seal trade certification allows crane operators to work in any province or territory. It is possible for crane operators to be promoted to supervisory positions with experience.

Additional Information

Industry Training and Apprenticeship Commission
http://www.itac.gov.bc.ca

Related Occupations

- heavy equipment operators (742)
- supervisor of crane operators (in 721 contractors and supervisors, trades)

> ***Crane operators generally enter the field as apprentices. As technology changes the work, those familiar with new machines and methods will have the best chances of securing work.***

Drillers and Blasters - Surface Mining, Quarrying and Construction

NOC 7372

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	790	760	950

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
190	200	390

Annual Growth 1998-2008	2.3%
Main Industries of Employment	
Construction	35%
Logging and Forestry	21%
Services Incidental to Mining	19%
Employment by Region	
Lower Mainland	25%
Vancouver Island	43%
Northern B.C.	18%
Okanagan/Kootenay	13%
Self-employment	5%

Nature of the Work

Drillers and *blasters* work together to break up rock and other surfaces for construction, surface mining and quarrying. Drillers operate mobile drilling machines to bore blast holes in open-pit mines and quarries and to bore holes for blasting and for building foundations at construction sites.

Blasters fill blast holes with explosives and detonate the explosives to break up ore and rock or to demolish structures. They are employed by mining, quarrying and construction companies and by drilling and blasting contractors.

Main Duties

Drillers and blasters work together to blast apart rock or ore, and in some cases, a worker may carry out duties associated with both job titles. However, there are specific tasks for each job. *Drillers* drive and operate tracked or truck-mounted rotary drilling, air-track or other drilling machines. They bore large blast holes to specified depths at staked positions in open-pit mines or quarries. They also operate drilling machines to drill blast holes in rock at road or other construction sites for building foundations or pilings.

Blasters read instructions or diagrams, lay out drill patterns and figure out the depth and diameter of blast holes. They perform mathematical calculations required to determine rock vibration and other related factors. They do field tests to determine the type and quantity of explosives required. They set up primer charges using detonators, fuses and other materials. They load explosives, connect detonation systems and detonate charges. An important additional responsibility is the handling, storage and transportation of explosives and accessories according to regulations. They also must make sure that safety procedures are observed.

Example Titles

driller:

- construction driller
- foundation drill operator
- open-pit driller
- rotary drilling machine operator

blaster:

- blaster, surface mining
- construction blaster
- open-pit blaster

Education and Training

Some secondary school education is required for *drillers* and *blasters*. While drillers may require heavy equipment operator experience, there are no additional requirements as they learn on the job from an experienced driller. Blasters require a licence.

To become a blaster within the mining industry in B.C., a permanent blasting certificate issued by the Ministry of Energy and Mines is required. Prospective blasters must be able to speak and write English. They work as an assistant under the supervision of a certified blaster for a period of three months to a year, then a written examination must be passed and an inspector must be satisfied that the applicant is qualified to perform the duties. Preparation for this exam includes both practical on-the-job training and education about explosives and blasting. Study guides are available to applicants. Upon recommendation of a mining company, an applicant writes the exam.

A two-year Mining program offered by the British Columbia Institute of Technology (BCIT) addresses all aspects of the industry, including blasting and diamond drilling. However, this does not provide sufficient training for a mine blasting certificate, and practical experience as a blaster's assistant and employment with a mining company are still necessary for certification. Grade 12 is required for entry into the BCIT program.

Blasting certificate programs through other organizations, such as the Workers' Compensation Board (WCB), are helpful in understanding the theory of explosives but are not recognized in the mining industry.

The WCB issues blasting licences for all sectors other than the mining industry, such as construction, logging and the motion picture industry. A blaster's handbook containing theory, regulations and safety procedures is available from WCB offices. Applicants for a blasting certificate must be at least 18 years of age and able to speak and write English. Documented evidence from employers of a minimum of six months' practical experience with an experienced blaster is required in order to be eligible to write the licensing exam. After successfully completing the exam, an interview is held to assess the applicant's practical knowledge. Licences must be renewed every five years.

Good hearing, eyesight and manual dexterity as well as good communication and analytical skills are important for drillers and blasters. Some knowledge of computerized machinery may be helpful. These workers must have an ability to follow safety procedures accurately and completely.

Working Conditions

These workers spend their time outside. The work tends to be noisy and dirty and has the potential to be dangerous. The work week is usually 35 to 40 hours on weekdays, but overtime or weekend work may be necessary, depending on deadlines.

Drillers and *blasters* have above-average earnings, according to 1995 salary figures. All workers, including those who worked part time or part year, earned an estimated average of $40,500, compared to the all-occupation average of $27,900. As in many occupations dependent on construction and natural resources, a lower than average proportion of workers are employed year round. Workers employed full time for the full year earned $49,000, compared to the provincial average of $39,400.

In 1998 there were 760 drillers and blasters in B.C., down from 790 in 1990. Only about 5% report being self-employed, compared to 15% of the workforce overall. Part of the reason for this low share of self-employment is probably the high cost of equipment and materials required to start up this kind of business.

Only about 33% of these workers report having full-time, full-year work. Most workers are employed full time but only for part of the year (58%), which is reflected in a high unemployment rate. Seasonal work is a factor, with winter layoffs common.

Drillers and blasters are employed mainly in a few industries. The construction industry is the largest employer, providing work for 35% of these workers. Logging and forestry is the second largest employer, employing 21% of these workers. The mining services sector, which includes drilling contractors, employs 19% of the province's drillers and blasters.

Geographically, these workers are distributed differently than the overall workforce. These workers are much less likely to live in cities. For example, 57% of B.C.'s working population are in the Lower Mainland, but only 25% of drillers and blasters live there. The Northern B.C region has almost twice its normal share, at 18%, the Okanagan/Kootenay region has 13%, and Vancouver Island is home to 43% of these workers. This distribution pattern of these workers is probably due to the workers' concentration in industries related to natural resources. As well, these workers move to follow "mega projects" that provide steady employment, such as the Island Highways project on Vancouver Island.

There were no women who identified themselves as being employed as drillers and blasters.

Compared to the rest of the workforce, these workers have an age profile that is similar to the all-occupation average, though there are fewer than average of the youngest workers (the under-25-year-old group). This is to be expected, as many drillers and blasters work up from related positions. Their average age is 38, the same as the all-occupation average.

Employment Prospects

These are very small occupations. Together, there were only about 760 *drillers* and *blasters* employed in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment of these workers to grow at an annual rate of 2.3%, faster than the average for all occupations. According to this projection, 390 positions will become available from 1998 to 2008. A little over half of these openings are projected to come from the need to replace workers who retire. The remainder will come from growth in the number of new positions.

Many of the new openings projected for these workers are for positions in services that are incidental to the mining industry. About 20% of drillers and blasters are currently employed in this industry, and its employment is projected to grow much faster than the average for all occupations. Employment growth in the construction industry will also be a source of growth for these workers.

The amount of work available for these workers expands and contracts regularly. Periods of high demand for these workers coincide with times when "mega projects," such as the building of the Vancouver Island Highway, are under way. However, when these projects are finished, the employment of these workers drops sharply. The best-qualified workers can usually keep themselves employed, but many in this occupation will face periods of unemployment or will have to move from area to area to find work.

Drillers often start as heavy equipment operators and progress to drilling positions with experience. *Blasters* may start out as blasters' helpers. Drillers and blasters often perform both drilling and blasting activities. It is possible to move up to supervisory positions with experience.

Additional Information

B.C. Road Builders and Heavy Construction Association
http://www.roadbuilders.bc.ca

Mining Association of B.C. http://www.mining.bc.ca

Ministry of Energy and Mines http://www.gov.bc.ca/em

Operators Training School
http://www.operatorstraining.com

International Union of Operating Engineers
http://www.iuoe.org
http://www.iuoe115.com

Related Occupations

- trades helpers (in 76 construction labourers and trades helpers)
- heavy equipment operator (742)
- underground miners and oil and gas well drillers (823)
- mine service workers (841)
- supervisors, mining oil and gas (822)

- contractors and supervisors, trades (721)

Commercial Divers

NOC 7382

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	180	190	190

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
0	90	90

Annual Growth 1998-2008

Main Industries of Employment

Other Service Industries	56%
Federal Administration	13%
Fishing and Trapping	12%

Employment by Region

Lower Mainland	35%
Vancouver Island	56%
Northern B.C.	3%
Okanagan/Kootenay	8%

Self-employment	34%

Nature of the Work

Commercial divers work underwater in commercial fishing, construction, inspection, search, salvage and repair. They are employed by diving contractors, fishing enterprises, shipping and marine construction companies and recreational diving services. Commercial diving provides work for very few people in British Columbia.

Main Duties

Commercial divers may find themselves working in a range of situations, depending on what work is available. In B.C. they often work in the aquaculture industry to harvest marine species and perform routine work on fish farms. They may use underwater video, sonar and other recording equipment for scientific or exploratory purposes. They may also participate in search and rescue, recovery and clean-up operations. With training and experience they may supervise and train other divers, especially hobby divers.

Construction divers perform construction duties, such as welding and installing pilings or footings for piers. They also maintain these and other structures. Some divers inspect ships, plant outflows, pipelines, sluice gates, and so on.

In salvage operations, divers use winches, derricks or cranes to raise sunken objects, or they may use explosives to remove obstructions and break up or refloat submerged objects.

All divers must also check and maintain their own diving equipment, such as helmets, masks, air tanks, harnesses and gauges. Some divers may work with remote-operated diving machines, "robots" of a sort that do underwater work. Some may also be involved in atmospheric diving, using submarine-like vehicles to do their work.

Example Titles

- aquaculture diver
- construction diver
- commercial diver
- diving instructor
- offshore diver
- underwater contractor
- underwater welder

Education and Training

In order to become a *commercial diver* employed with a construction company, graduation from secondary school and a recognized commercial diving school program are usually required. Divers must meet the Commercial Diving Competency Standards of the Canadian Standards Association. For divers involved in blasting, a provincial blaster's licence issued by the Workers' Compensation Board (WCB) is required. See the profile *drillers and blasters* (NOC 7372) for details about obtaining a blasting licence.

North Island College has a comprehensive Professional Diving program, which has three courses, each with its own level of certification. The 24-day occupational scuba diving course is the first step toward occupational scuba diving and does not require prior experience. This course is the basic level recognized by the WCB to enter employment as a commercial diver using scuba techniques. The second course is designed to enable qualified Occupational Scuba Divers to upgrade to the use of surface supplied air equipment. Training is about two weeks, and students learn skills required to work in the sea harvest diving industry, including navigation, boat maintenance and handling, anchoring product information and handling, safety and underwater communications. The third course is for occupational scuba tenders who learn to assist professional divers but do not dive. The course is designed to meet new WCB requirements that the tender have formal training in Dive Accident Management.

The other formal certificate training programs in commercial diving offered in Canada are in Ontario. They are at Seneca College, which offers a 34-week certificate program in underwater skills, and at the Canadian Working Divers Institute, which offers 12 weeks of intensive training. The minimum entrance requirement for both programs is a high school diploma or equivalent. Applicants must also have an open water scuba diving certificate from an approved organization, a commercial diving medical certificate from an approved physician, and valid CPR and First Aid certification.

There are three commercial diving programs in the United States, and the closest one to B.C. is located in Seattle, Washington. The Divers Institute of Technology offers a one-year program.

Commercial divers who work in the fishing industry do not generally require the complex diver education detailed above. Seafood harvesting divers must have a licence from the WCB. To apply for a licence, an individual must have a seafood harvesting diving certificate and a WCB medical certificate. A licence is issued after passing an examination. This licence allows for a particular type of seafood harvesting and may be limited to either scuba diving or surface air-supplied diving.

As diving is mentally and physically demanding, stamina is important for these workers. Divers must have an understanding of the physical and physiological effects of pressure. Industrial diving is very complicated and requires additional skills, such as mechanical aptitude, familiarity with welding and cutting equipment, knowledge of basic carpentry, an ability to adapt tools and fittings to jobs underwater, and an understanding of hydraulics and compressed air. Industrial divers are more likely to require grade 12 reading and writing skills.

Working Conditions

Divers have the unique working condition of doing much of their work underwater. In order to make a living, they combine their diving skills with other tasks, such as welding, repairing underwater structures or harvesting marine species. Some workers who do underwater work have formal qualifications and training in another area, such as construction and welding.

Divers work from boats, docks and shorelines and are outside year round when work is available. They generally don't dive in extreme weather, although some duties, such as search and rescue work, may require diving in less than ideal conditions. Technological change, such as the increased use of remote-operated vehicles, is changing the working conditions and duties of some divers.

Less than one-third of divers can expect to find full-time, full-year work, but the work pays well. Many divers have to piece together short periods of work for a number of employers or work on contracts. For example, construction divers rarely have a project that supplies more than 90 consecutive days of work. Working underwater is physically and mentally demanding, and the active career of a diver is often only a few years. Divers must be in excellent overall health to withstand the physical challenges of underwater work.

According to 1995 salary estimates, workers in this occupation had near-average earnings, $40,000 for workers employed full time for the full year, compared to the provincial average of $39,400. The overall average salary for divers, including those who worked part time or part year, was $32,300 per year, slightly above the workforce average for all occupations of $27,900.

This is a very small occupational group. In 1998 there were 190 commercial divers in B.C., up from 180 in 1990. There were about 60 construction divers registered with the Pile Drivers, Divers, Bridge, Dock and Wharf Building Union in 1996. Industry sources believe the number of working divers is much higher than this total, but there are no statistics available that prove this. It may be that many divers work part time and have other occupations or that diving is only one part of their duties (for example, retailers who run diving supply shops).

Self-employment amongst these workers is quite common, as many divers contract out their services. Experienced divers may open their own dive centres. Compared to 15% of the workforce overall, 34% of this group report being self-employed. There are also regional influences on self-employment in this occupation, for instance, more than half (56%) the divers on Vancouver Island are self-employed. As previously mentioned, there is a low level of full-year, full-time work, and only 30% of divers work full time for the whole year. Of the remainder, 53% work full time for part of the year.

Diving equipment is expensive to purchase, and it must be maintained in perfect condition. Because of this, some divers work for contractors who supply equipment. A diver who has his or her own equipment can expect to charge a higher rate to cover the overhead. Construction divers dive using special protective "hard hat" equipment, which is almost always supplied (with the exception of personal items like wetsuits and gloves).

Seasonal work is to be expected in this occupation, though it may not follow the typical winter slowdown pattern. The type of work will often determine what season and weather conditions are best. For example, underwater visibility is often improved under winter conditions. There is a greater possibility of year-round work in the south coast region and on Vancouver Island. Divers often have to move from area to area to find steady work. In many cases, this means work outside the country. B.C. contracting firms regularly send crews and divers on international projects. Not surprisingly, the unemployment rate for divers is much higher than the provincial average.

Divers are employed in about 10 different industries in B.C. The most significant area for employment of this group is the service industries, which include equipment rental services and various repair services. This sector employs 56% of the province's divers. The second largest employer is the federal government (13%) and then the fishing industry, with 12% of these workers. Divers also find work with water transport companies, such as shipping and passenger services who need divers for repair and inspection. They may also work in the retail trade, professional business services, as well as for recreational diving companies.

Geographically, divers are most likely to live on Vancouver Island, which may be in part a reflection of the growth in recreational diving and other water related tourism activities. More than half (56%) of B.C.'s divers live on Vancouver Island, followed by the Lower Mainland, with about 35% of this group. The Okanagan/Kootenay region is home to approximately 8% of commercial divers, and the remaining 2% live in Northern B.C. Freshwater work in lakes and rivers is often tied to industrial activity, such as pulp mills (which need divers to monitor effluent outfalls) and hydroelectric dams.

Less than 1% of professional divers in B.C. are women.

Compared to other occupations, divers are considerably younger. Their average age is 32, six years younger than the average age for all workers in B.C. For the most part because of the physical demands of this work, 62% of the divers are under the age of 35, compared to 40% of the total workforce.

Employment Prospects

This is one of the smallest occupational groups profiled in *Work Futures,* and it is made up of only about 190 *commercial divers*. The Canadian Occupational Projection System (COPS) projects employment of these workers to remain at this level through to 2008. Although some openings are projected to become available in order to replace divers who retire, these replacement openings amount to only 90 positions.

Competition for these few openings will be high because there is usually a surplus of qualified divers. This is a result of the low demand for divers as well as of the attractiveness of this field to young people. This is reflected in the high number of divers who do not have full-time work or who are unemployed. Many divers decide to work abroad because they cannot find enough work in B.C.

According to industry sources, most successful commercial divers have an additional specialty besides diving, such as electronics or welding. Electronics is a particularly good specialty because of the increasing use of electronic water equipment. Experienced divers and divers with construction skills and experience also will be at a competitive advantage when competing for employment opportunities.

Experienced divers often move on to run their own contracting services or open dive centres. Additional training and skills in business management are necessary for these workers. *Construction divers* may also advance to management or supervisory positions in construction firms. Experienced divers can become instructors for hobby divers, once the appropriate certification is obtained. Hobby divers considering professional work may not be easily accepted without additional training or experience.

Additional Information

Canadian Working Divers Institute
http://www.canadianworkingdivers.com

Dive Web Commercial Diving http://www.diveweb.com

Divers Institute of Technology
http://www.diversinstitute.com

Related Occupations

- aquaculture labourer (in 861 primary production labourers)
- aquaculture technician (in 825 contractors and operators in agriculture and aquaculture)
- instructor in sport (in 525 athletes, coaches and related occupations)
- welders (in 951 welders and related machine operators)

Competition for these few openings will be high because there is usually a surplus of qualified divers. This is a result of the low demand for divers as well as of the attractiveness of this field to young people.

Motor Vehicle and Transit Drivers

NOC 741

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	40,230	44,030	50,560

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
6,530	6,350	12,880

Annual Growth 1998-2008 1.4%

Main Industries of Employment

Truck Transportation	30%
Public Transit and Other Transportation	20%
Wholesale Trade	9%

Employment by Region

Lower Mainland	52%
Vancouver Island	16%
Northern B.C.	15%
Okanagan/Kootenay	17%

Self-employment 17%

Nature of the Work

The professional *drivers* in this group drive commercial vehicles, ranging from tractor trailers to passenger cars, to transport people or goods. Some regularly work local routes, whereas others make transcontinental runs. They are employed by transportation companies, municipal governments, manufacturing and distribution companies, retail goods and services companies and the mining industry, or they may be self-employed. This is a very large occupational group.

©Stone/Vancouver

Main Duties

All workers in this group operate motor vehicles. They must be skilled at manoeuvring their particular vehicles. For example, *truck drivers* must be able to back into loading bays, and *delivery drivers* need superior city parking skills. They must drive defensively in all conditions. In most cases, they need to be able to perform minor maintenance and repair on their vehicles. They also need to keep records on their cargo, whether it be people or goods, and often keep vehicle logs, such as fuel consumption information. Drivers of all sorts work with central dispatchers and must keep in contact to report problems or delays. In most cases, drivers will work directly with customers and clients, although the amount of contact varies. Many of these workers are self-employed and therefore will need to do bookkeeping and financial management tasks.

The type of work performed by workers in this occupational group changes depending on specific requirements. Workers who primarily transport large quantities of goods (*long-haul* and *local truck drivers*) must oversee the loading and unloading of their cargo and make sure it is safe and secure. They are often required to do some or all of the loading themselves, especially if they are transporting hazardous goods. Long haul drivers must report to weigh scales. If they are moving between provinces or into the United States, they must make sure that they have all the necessary documentation and permits. Some drivers, such as those working for wholesalers, will have regular routes within a relatively small area, or they may have regular runs between cities.

Courier and *delivery drivers* work for retail or service employers. They spend more time in direct contact with customers and tend to drive smaller vehicles than long-haul truckers. They usually work in a small geographic area or part of a city, dropping off items, taking payment from customers and sometimes travelling a specific route to sell products.

Transit and *bus drivers* work extensively with the public. They operate full-size buses and special smaller buses equipped to carry the physically challenged. *School* and *public transit bus drivers* drive an established route, stopping regularly to take on and let off passengers. Transit drivers also collect fares, provide transfers and answer questions from the public. Some *bus drivers* work for commercial tour companies and may also provide information and commentary as they travel. These drivers and inter-city bus drivers also routinely assist with luggage. School bus drivers are particularly responsible for the safety of their passengers and must be very watchful when collecting or discharging children.

Taxi and *limousine drivers* also transport people, based on individual destinations rather than routes. They generally need to be very knowledgeable about the area in which they drive and to have a courteous and helpful manner when dealing with the public. They assist passengers with luggage and in boarding vehicles, and they collect flat-rate fees or meter fares. Limousine drivers who work for corporate or private employers may have additional duties, such as running errands (for example, delivering and picking up mail or business documents).

Example Titles

truck driver (7411):
- dump truck driver
- flatbed truck driver
- logging truck driver
- long haul truck driver
- moving van driver
- tow truck driver
- truck driver, tractor-trailer

transit and bus drivers (7412):
- bus driver
- ground transportation driver
- public transit driver
- sightseeing tour driver
- school bus driver

taxi and limousine drivers and chauffeurs (7413):
- airport limousine driver
- chauffeur
- limousine driver
- taxi driver

delivery drivers (7414):
- delivery driver
- driver salesperson
- food delivery driver
- vending machine driver-supplier

Education and Training

Some secondary school education is a common requirement for *motor vehicle drivers. Bus* and *transit drivers* usually require grade 12 or equivalent. Although on-the-job training is generally provided, completion of a professional driving program is often advisable as well. Appropriate driving licences must be obtained, and some driving experience is usually necessary. Evidence of at least one year of safe driving experience is usually required.

Drivers of light trucks require at least one year of basic driving experience and a Class 5 driver's licence. *Drivers of heavy trucks* need previous light truck driving experience with a Class 3 licence to operate a vehicle with three or more axles and a Class 1 license to operate a tractor and trailer unit. A good driving record is vital, and training in automotive mechanics is an asset. Air brake endorsement is necessary for drivers who operate vehicles equipped with air brakes.

Training recognized by the Office of the Superintendent of Motor Vehicles is available at private training schools and can be followed by an examination conducted by a provincial government-appointed Driver Services Centre. Drivers who transport hazardous products or dangerous goods must be trained and certified by their employers.

To be a *delivery driver,* a Class 5 licence is needed. A thorough knowledge of the geographical area where deliveries will be made is necessary. Many establishments require that drivers have their own vehicles.

Bus and *transit drivers* usually require up to three months of on-the-job training including classroom instruction. Bus drivers must be at least 19 years old and require a Class 2 licence. They must be able to think and act quickly since they must simultaneously drive their vehicles safely and answer passengers' questions while maintaining a schedule.

Northern Lights College, in cooperation with the B.C. trucking industry, has developed a six-week (self-paced) Professional Driver Education program. The program covers theoretical and hands-on training. A Professional Driver Training continuing education course at Northwest Community College is designed to impart the skills needed to obtain a Class 1 licence. A Motor Vehicle Operating Skills program at North Island College offers courses in air brakes operation and maintenance as well as professional driver training.

Taxi and *limousine drivers* and *chauffeurs* require a Class 4 licence. These drivers should have a thorough knowledge of the geographical area in which they will be working. Taxi drivers and chauffeurs usually require a municipal permit to operate their vehicles in a particular town or city. The Justice Institute of B.C. has a week-long Taxi Host Program (Levels 1 and 2) designed to improve the safety and service of taxi drivers.

Good communications skills and an ability to handle problems on the road are necessary for motor vehicle and transit drivers. Employers look for responsible, safety-conscious, self-motivated individuals. Some mechanical aptitude is often required. First aid skills are an asset. For those who plan on starting their own companies, business skills are required. Computer skills may be an asset. Those who interact with the public should have good interpersonal skills. Workers with a willingness to learn new techniques and skills will have an advantage.

Working Conditions

Workers in this occupational group spend most of their working day in their vehicles, which are generally comfortable, but drivers often suffer from sore backs from long hours sitting down. With the notable exception of bus drivers, these workers are often expected to use their own vehicles. Public transit, tour bus and limousine drivers usually wear uniforms, as do some delivery drivers. Truck and transit drivers may belong to a union. However, union membership is quite rare for taxi and delivery drivers.

Hours of work are quite varied, though a 40 hour week is common. Many drivers will work evenings and weekends, and some, such as long-haul drivers, work through the night. Some trucks are equipped with "sleepers," and drivers may work in pairs so that they can drive 24 hours a day. Some drivers may routinely stay overnight in accommodation along the way. Split shifts are particularly common for transit drivers, especially when they are new workers first earning seniority. Long, irregular hours are the biggest disadvantage in this industry.

In 1995 workers in this occupational group had earnings close to the provincial average ($39,400), an estimated $35,200 for workers employed full time for the full year. However, a majority of workers don't work full year, full time. The average salary for all these workers, including those employed part time and part year ($28,300), is slightly higher than the overall average salary for the whole workforce ($27,900). Entry-level salaries earned by recent college graduates averaged between $1,480 a month (full time) for delivery drivers to approximately $3,080 a month (full time) for truck drivers.

Within the specialties, the best salaries are earned by *truck drivers* (excluding light truck delivery drivers), who make on average $38,400 for full-time, full-year work. Hourly rates for truck drivers (at the end of 1995) ranged from $15 to $24 for union drivers and $10 to $20 for non-union workers. In many cases, truck drivers are paid by the mile, or on a percentage basis, rather than by the hour.

Bus drivers can expect to make $11 to $20 an hour in the union and $8 to $15 an hour in non-union jobs. Their overall average annual salary in 1995 was $31,600, while workers who worked full time, full year earned an average of $39,700.

Taxi drivers, earning an average of $19,800 for full-year, full-time work, had the lowest salaries. They usually work for a percentage of total fares. Ten-hour days are not unusual, and if business is bad, generally there is no guaranteed wage.

Delivery drivers often earn little more than minimum wage, though like taxi drivers and tour bus drivers, they can receive additional income in the form of tips. Better terms are available for owner-operators, though overhead is correspondingly higher.

This is a very large occupational group. In 1998, there were 44,030 people in these occupations in B.C., up from 40,230 in 1990. More than half of this total (50%) are truck drivers. The next largest group is delivery drivers, with about 28% of workers in this category. Only 14% work as bus drivers and about 9% as taxi and limousine drivers.

7

Self-employment among this group is fairly common. Of the entire group, 17% report being self-employed, compared to 15% of the workforce overall. Taxi drivers are significantly more likely to be self-employed. Almost a third (30%) are self-employed. In some areas taxi drivers may have to wait for a licence to work on their own. By contrast, only 2% of transit drivers reported being self-employed.

Of this group 48% work full time, full year, just above the total workforce average (47%). The level of part-time work for this group (16%) is below the all-occupation rate for part-time employment in B.C. (26%). Out of this group, delivery drivers are most likely to work part time (29%), and many workers see the job as a short-term way to increase their income (for example, while attending school). Bus drivers and taxi drivers are also likely to work part time. To some extent this is the normal path to securing a full-time job for bus drivers.

Trucking industry sources expect increases in part-time and contract work as well as self-employment among truck drivers. This is supported by the increased demand for drivers who use their own vehicles for work.

Transit drivers experience the lowest unemployment rate in this group. Delivery drivers have an unemployment rate equal to that of the provincial average, but taxi drivers and especially truck drivers have higher than average unemployment rates.

The Okanagan/Kootenay and Northern B.C. regions have the highest incidence of unemployment for truck drivers. Some truck drivers are employed in seasonal industries, such as logging, and therefore are subject to layoffs. Of course, as it is a very large occupational group, even an average unemployment rate would result in many unemployed workers. Often the available job opportunities for truck drivers are for owner-operators or for workers willing to use their own vehicles.

Drivers are employed across a wide range of industries. Truckers especially can be found working in most sectors. Most products that need to be moved or distributed end up on a truck at some point. The most significant industry for employment of this group is truck transport, which includes large general freight companies as well as more specialized companies, such as household movers and forestry truck services. This sector employs about 30% of workers in this occupation. The second largest employer is public transit and passenger transportation (which includes taxi and bus companies as well as public transit authorities), employing 20% of these workers. Other major employers include wholesale and retail trade, food services, postal and courier services, construction and the mining industry.

Geographically, truckers are less likely than the average worker to live in the province's largest cities. Only 44% are found in the Lower Mainland region, compared to 57% of the workforce in general. Vancouver Island also has a below-average share, resulting from the low number of these workers in Victoria. Instead, larger than proportional numbers are found in Northern B.C. and in the Okanagan/Kootenay region. Living in the city gives truckers no professional advantages, especially in the case of those in the forest industry (and long-haul truckers to a lesser degree).

Among the other drivers, however, the urban share of workers tends to be above average. Services such as public transit, taxis and delivery services are more cost-effective where people are clustered together. As a result, about 62% of these other drivers work in the Lower Mainland. The province's other regions have average or slightly below average amounts.

Only about 7% of workers in this occupation are women, although this representation varies by specialty. Only 2% of truckers are women, but 18% of transit drivers are women.

The average age of this occupational group, at 40, is slightly higher than the provincial workforce average. However, the average age of workers in this group depends somewhat on the specific job. Delivery drivers, who often use the job to gain experience or income when starting their careers, are on average only 34, but transit drivers, who generally hold steady, well-paid jobs, are older than average, at 45.

Employment Prospects

This is a very large occupational group, made up of about 44,030 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment in this group to grow at an annual rate of 1.4%, about as fast as the average for all occupations. According to this projection, 12,880 positions will become available from 1998 to 2008. A little over half of these openings are projected to come from growth in the number of new positions, and the remainder will come from the need to replace workers who retire. Many additional openings will result from a high rate of worker turnover, especially in entry-level service sector positions (for example, food delivery).

Although there are a number of different occupations in this group, employment in most of these individual occupations is projected to grow at about the same rate. For this reason, their relative sizes approximate the relative number of projected openings for each occupation in this group. The slight exception is *bus drivers, subway operators* or *other transit operators* where employment is expected to grow more slowly than average.

Half of all workers in this group are *truck drivers*. A total of 6,300 openings are projected to become available for these workers between 1998 and 2008. Trucking has become a crucial component of the Canadian economy, transporting about two-thirds of the value of all trade to and from the U.S. The North American Free Trade Agreement (NAFTA) and a low Canadian dollar both have contributed to a growing amount of trade between B.C. and the U.S. According to industry sources this will continue to be a major source of employment growth for truck drivers.

One source of uncertainty with the employment projection for truck drivers is the possible merger between Canadian National (CN) Rail and a large U.S. rail company, Burlington Northern Santa Fe (BNSF) Rail. Rail transportation is a major source of competition for the trucking industry. According to industry sources, if this merger takes place, it will increase the efficiency of the two companies. This would enable these rail companies to capture a larger market share, leaving less for the trucking industry. Uncertainty about future fuel prices is also a source of uncertainty within the trucking industry.

According to industry sources, although the vast majority of truck drivers are employed by companies, the trend toward self-employment of these workers is expected to continue. They also indicate that there is currently a growing shortage of experienced truck drivers because of the senior age structure of these workers. A significant proportion of drivers are over the age of 50 and are likely to retire in the next ten years. Industry sources also expect the recruitment of truck drivers to remain a major issue for companies because of the high turnover of these workers. The lifestyle associated with long-haul trucking is a factor that contributes to this high turnover and that also discourages young people from entering this occupation. Experienced truckers often move into lower-paying, non-driving occupations simply because they are tired of living on the road.

In order to enter the field of truck driving, it may be necessary to spend time in more junior positions in a trucking company, such as a yard-worker or a dock handler. Truck drivers may then progress to delivering locally before they have sufficient experience to be given long-haul assignments.

About 28% of all workers in this occupational group are *delivery drivers*. Projections call for a total of 3,590 openings for delivery drivers through to 2008.

Only around 14% of the workers in this occupational group are either *bus drivers, subway operators* or *other transit operators*. A total of 1,740 openings are projected for these workers, and over half are openings due to retirements. *Transit drivers* often have previous experience as truck drivers. These workers most often must progress through part-time and split-shift assignments before getting a regular full-time assignment. Competition for transit driver openings is often very strong, and excellent communications and interpersonal skills are a definite advantage amongst applicants.

Taxi and *limousine drivers* and *other chauffeurs* make up a little less than 10% of this group. A total of 1,270 openings are projected for these workers. Limousine drivers usually have experience as taxi drivers. Other drivers in this group can usually enter these jobs without specific related experience other than a good driving record.

Self-employment is not uncommon for workers in this occupational group. However, the initial investment, especially for truckers, can be high, and an owner-operator will often take on part-time relief workers to keep the vehicle on the road and earning 24 hours a day. Drivers planning to become self-employed are well advised to get additional training and experience in financial management.

With experience, most drivers can advance to supervisory positions or other non-driving but related occupations, such as dispatchers, driving instructors or inspectors.

Additional Information

For *truck drivers*
Teamsters Canada http://www.teamsters-canada.org

B.C. Trucking Association http://www.bctrucking.com

For *transit and bus drivers*
Canadian Urban Transportation Association (CUTA)
http://www.cutaactu.on.ca

Amalgamated Transit Union (ATU) http://www.atu.org

For *taxi drivers*
Justice Institute of B.C.
http://www.jibc.bc.ca/ptec/f-ptec.html

"A Study of the Taxi Industry in British Columbia"
http://www.th.gov.bc.ca/bchighways/taxi/taxi.htm

Related Occupations

- railway and motor transport labourers (in 76 construction labourers and related occupations)
- dispatchers (in 147 recording and distributing occupations)
- heavy equipment operators (742)
- supervisors, motor transport (722)
- driving instructor (in 4131 college and other vocational instructors)

Heavy Equipment Operators

NOC 742

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	8,170	9,270	10,270

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
1,000	3,180	4,180

Annual Growth 1998-2008	1.0%
Main Industries of Employment	
Construction	43%
Public Transit and Other Transportation	9%
Logging and Forestry	9%
Employment by Region	
Lower Mainland	28%
Vancouver Island	20%
Northern B.C.	25%
Okanagan/Kootenay	27%
Self-employment	13%

Nature of the Work

This unit group includes workers who operate heavy equipment used in the construction and maintenance of various work sites. They are employed by construction companies, contractors, public works departments and logging companies.

Main Duties

The duties of these workers vary, but there are some common ones. They control equipment by moving levers, foot pedals and operating switches. They conduct operational checks on equipment and clean and lubricate it. They practise and observe safety procedures and sometimes need to follow the signals of crew members.

Bulldozer operators clear and level land on construction, mining and forestry sites and push other equipment to provide traction and assistance when needed.

Backhoe operators use a variety of attachments to dig trenches, load heavy materials, vibrate and break rock or concrete, back-fill excavations and scoop and dump materials.

Front-end loader operators operate machines with buckets on the front to pick up heavy loads and dump them in piles or into trucks.

Grader operators spread and level earth, sand, gravel and rock at construction sites. They also regulate the height and angle of grader blades to level surfaces to requirements.

Paver operators operate machines that lay, spread or compact surface materials in highway and road construction with the aid of stakes and level gauges. They may also operate trucks equipped with road sanding, road oiling and other similar apparatus.

Power shovel operators manipulate booms or cranes. Each of these machines support a dipper handle that scoops up material and drops it into trucks or piles.

Sanitation truck drivers remove garbage and refuse, then dump loads at designated sites.

Street sweeper operators drive vehicles equipped with rotating brushes to remove sand, litter and trash from streets, highways and parking lots.

Example Titles

- apprentice asphalt plant operator
- backhoe operator
- bulldozer operator
- dredging equipment operator
- excavator operator
- grader operator
- heavy equipment operator
- loader operator
- paving equipment operator
- side boom tractor operator
- road oiling truck driver
- shovel operator
- sewer flushing truck operator
- snow-removal equipment operator
- apprentice piledriver and bridge worker

Education and Training

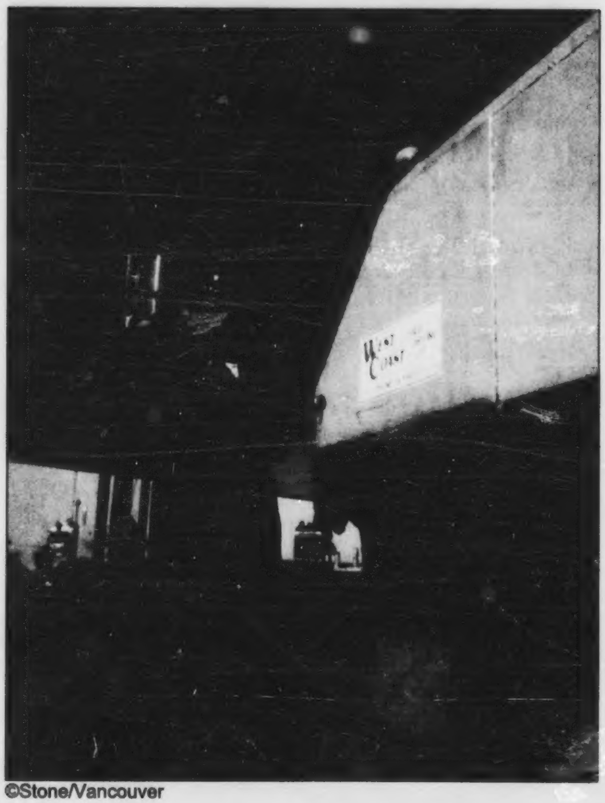
Some secondary school education is required for *heavy equipment operators* and may be required for *public works maintenance equipment operators*. Apprenticeships are available for boom truck operators. Current details on these apprenticeships can be obtained by contacting a local apprenticeship office. Generally, a Class 5 driver's licence is sufficient, but a driver's licence appropriate to a specific type of equipment may also be required.

Heavy equipment operators usually complete high school, college or industry courses in heavy equipment operating as well as on-the-job training. Some employers may require internal company certification. Some locals of the Union of Operating Engineers provide training courses for this occupation. A Heavy Equipment Operator program is offered at Malaspina College. Training can be customized to meet both individual needs and those of employers and industry. Training is available on excavators, backhoe/loaders, front-end loaders, graders, bull dozers and gravel trucks. Class 1 and 3 driver training is also available. Applicants to this program must be a minimum of 19 years of age and have grade 10 or equivalent.

The Operators Training School in Langley B.C. is a private post secondary institution that offers various heavy equipment training. All courses place emphasis on skill development by actual equipment operation on a simulated job site. These courses are competency based and job oriented.

Public works maintenance equipment operators usually require experience as public works labourers, and further training is provided on the job.

These workers should be physically fit and able to adapt to rugged working conditions. Mechanical dexterity and comfort with computerized equipment is also necessary. An aptitude for mechanical repairs and maintenance is helpful. Operators must be able to tolerate high noise levels. Good communication skills are necessary, and employers look for individuals who are able to work without supervision.


©Stone/Vancouver

Working Conditions

Workers employed in this occupational group should be prepared to work in noisy, dusty and dirty environments in almost any kind of weather. Some operators may work in air-conditioned and dust-controlled cabs. Those who operate excavating and grading equipment have to sit for long periods of time on vibrating or bouncing machinery. Hearing protection, special safety boots, gloves, goggles and hats are often required.

Hours of work vary from worker to worker. For example, a *snow-removal operator* may start clearing streets at three o'clock in the morning and work until the snow is cleared from the roads. A *bulldozer operator* may work an eight hour day starting at seven o'clock in the morning. In some cases, considerable overtime and weekend work may be required. Employment for some *heavy equipment operators* is on a project-to-project basis, and travel away from home may be required.

The average earnings for heavy equipment operators were $36,300 in 1995, compared to the provincial average of $27,900. Those who worked full time, full year earned an average of $43,700, which is also above the provincial average of $39,400. According to industry sources, entry-level operators working full time, full year can earn between $18,000 and $38,400. A survey of recent college graduates found that those who found employment as heavy equipment operators earned about $3,650 a month for full-time work. A qualified and experienced operator can earn between $32,400 and $60,000 per year.

The number of workers employed in this large occupational group increased from 8,170 in 1990 to 9,270 in 1998. About 85% of this group are heavy equipment operators, and 15% are public maintenance equipment operators. Entry positions may require a union membership.

Overall, self-employment (13%) is close to the provincial self-employed average (15%). Heavy equipment operators have more opportunity for self-employment than do public works maintenance equipment operators.

The level of part-time work among these workers (8%) is below the provincial average of 26%. A majority of heavy equipment operators (92%) are employed full time for all or part of the year, and 42% are employed full time, full year.

The unemployment rate for this group is exceptionally high, reflecting the seasonal nature of this work. Heavy equipment operators must be prepared for periodic layoffs. Public works maintenance equipment operators work year round if they are experienced with various types of machinery. Those working for local governments often work winter months removing snow from roads and spend the summer cleaning the streets.

Workers in this group are mainly employed in the construction industry (43%). Most of the rest are employed in services related to transportation maintenance (9%), logging and forestry (9%), utility companies (8%) and local government services (6%).

Very few of these workers are located in the Lower Mainland (28%) compared to the total workforce population (57%). The Okanagan/Kootenay (27%), Northern B.C. (25%) and Vancouver Island (20%) all have much larger than average shares of these workers compared to their overall provincial employment share. Large sections of highway construction and maintenance along with logging and forestry activities account for these larger than average proportions outside the Lower Mainland.

Employment estimates show that men have traditionally dominated this occupational group. Women hold less than 2% of these jobs.

Only 7% of workers are under the age of 25, which is below the all-occupation average for this age group. Such a small proportion suggests that obtaining entry-level positions may be difficult for younger workers because of training requirements. The average age in this group is 41, which is three years above the average age for all workers in B.C.

Employment Prospects

This is a large occupational group, made up of about 9,270 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment in this group to grow at an annual rate of 1.0%, more slowly than the average for all occupations. According to this projection, 4,180 employment opportunities will become available from 1998 to 2008. As a result of an aging workforce, particularly for this occupational group, over three-quarters of these openings will result from the need to replace workers who retire. The remainder will come from growth in the number of new positions.

A small proportion of these workers (15%) are *public works maintenance equipment operators*. About 15% of the openings projected for this entire occupational group (680 in total) are for these workers.

The remaining 3,510 openings are for *heavy equipment operators* who work mainly in the construction and forestry industry. The amount of work available for these workers expands and contracts regularly. Periods of high demand for these workers coincide with times when "mega projects," such as the building of the Vancouver Island Highway, are under way. However, when these projects finish, employment of these workers drops sharply. Although workers with the highest qualifications can usually keep themselves employed, this often requires relocating.

Technology will continue to provide more advanced equipment, enabling heavy equipment operators to be more productive and to perform their work with greater precision. This will require more highly skilled and multi-skilled workers. According to industry sources, employers are having difficulty filling positions in this field because of a shortage of technically qualified equipment operators.

Public works maintenance equipment operators are less affected by economic change because they are always needed to maintain roads, streets and highways, as well as to carry out other upkeep activities in cities or towns. However, fiscal restraint at the local government level will continue to restrict the growth in employment of these workers. Workers can often work year round if they are experienced with various types of machinery. Due to environmental concerns, people are encouraged to recycle more, and more goods are recyclable. This might lead to a growing need for recyclable goods collection workers. However, competition for all public works equipment operator positions is very strong, with the supply of potential workers exceeding the demand. Those already working in labouring positions are at a competitive advantage as they can apply internally for any openings.

Some workers may progress to supervisory positions with experience. In addition, mobility is possible among occupations in this group.

The primary methods that employers use to recruit workers for these occupations are newspaper ads, direct contact from applicants and advertisements at Human Resource Centres of Canada (formerly Canada Employment Centres).

Employers can be found by using the index at the back of the telephone book and by looking in the yellow pages under headings such as construction, contractors, public works departments and logging.

Additional Information

Operators Training School
http://www.operatorstraining.com

International Union of Operating Engineers
http://www.iuoe.org
http://www.iuoe115.com

Related Occupations

- contractors and supervisors, trades (721)
- crane operators (7371)
- logging machinery operators (8241)
- underground miners, oil and gas and related workers (823)
- longshore workers and material handlers (745)
- trades helpers in construction and related occupations (76)
- truck drivers (in 741 motor vehicle and transit drivers)

Advancing technology will enable workers to be more productive and more precise.

Other Transport Equipment Operators and Related Workers

NOC 743

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	6,190	5,790	5,500

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
-290	970	680

Annual Growth 1998-2008	-0.5%
Main Industries of Employment	
Air Transportation	27%
Water Transportation	25%
Rail Transportation	23%
Employment by Region	
Lower Mainland	52%
Vancouver Island	26%
Northern B.C.	12%
Okanagan/Kootenay	10%
Self-employment	5%

Nature of the Work

Railway, ship and airline workers in this occupational group operate and maintain equipment and perform a variety of support duties both in the passenger and cargo transportation industry. They are employed by railway and marine transport companies, the federal government, ferry companies, marine sightseeing companies, water taxi services, canal, port and harbour authorities, logging, airline and air services companies and ferry terminals.

Main Duties

The duties of these workers vary, but there are some common ones. They regulate traffic, repair transportation equipment and control entrances at various locations. They operate servicing vehicles and equipment. These workers may also handle cargo and passenger baggage and perform other support duties.

Railway yard and *track maintenance workers* align trains for servicing and operate controls regulating railway traffic. They are responsible for switching train cars according to location, destination and number of cars needed. These workers also clean, lubricate and make minor repairs to railway cars, locomotives and other equipment. Railway track maintenance workers operate machines and equipment to lay, maintain and repair railway tracks. Most importantly, they remove snow and debris and attend to damaged or broken tracks. They are employed by railway transport companies.

Deck workers stand watch and steer ships and other marine transport under the direction of an officer. They are responsible for operating and repairing deck equipment, such as winches, cranes, derricks and hawsers. These workers clean and paint deck surfaces, handle mooring lines and repair ropes, wire, and cables.

Engine-room crew workers assist ship engineers in maintaining the ship's engine, machinery and auxiliary equipment. They also operate and maintain off-loading liquid pumps and valves, and they clean the engine and engine-room. They are employed by marine transportation companies and government departments.

Lock and *cable ferry operators* operate equipment and controls to direct movements for gates, bridges and cable ferries. They are responsible for performing routine maintenance and repairs on vessels in addition to collecting tickets or fares from passengers. Most importantly, they operate controls to adjust the landing bridge, gates and docking devices. They are employed by cable ferry companies, ferry terminals and government.

Ferry terminal workers operate controls to adjust landing bridges, position or remove gangplanks, open or close doors and gates, and secure or remove docking devices. They also signal passengers and motor vehicles to embark and disembark and collect tickets or fares from passengers.

Boat operators operate motorboats, launches, small ferry boats and other vessels to transport passengers or freight. They may be responsible for checking for pollutants around ports and harbours, patrolling beaches, sorting logs and forming log booms. They are also responsible for maintaining boats and on-board equipment, such as engines, winches, derricks, fire extinguishers and life preservers. They are employed by marine companies that provide sightseeing tours or water taxi services, as well as by harbour authorities.

Air transport ramp attendants load and unload passenger baggage and are responsible for transporting freight between the aircraft and the warehouse. These workers also position passenger loading stairs and operate aircraft cargo doors. In some cases, they direct aircraft to gate positions and operate tow trucks, food service trucks, de-icer sprayers, fuel trucks and lavatory servicing trucks. While the aircraft is at a stopover, these workers also clean and prepare the aircraft interior for the next flight. They are employed by airline and air services companies.

Example Titles

railway yard and track maintenance workers (7431, 7432):

- control tower operator, railway
- machine operator, railway
- track patroller, railway
- section worker, railway
- tie tamper operator
- yard coupler, railway

deck crew, water transport workers (7433):

- deckhand
- ordinary seaman/woman
- wheelsman/woman

engine-room crew, water transport (7434):
- marine engine mechanic
- marine engine oiler
- ship boiler tender

lock and cable ferry operators (7435):
- cable ferry operator
- ferry terminal worker
- loading bridge operator

boat operators (7436):
- boom boat operator
- charter boat operator
- sightseeing boat operator
- water taxi operator

air transport workers (7437):
- aircraft groomer
- baggage handler
- cargo attendant
- airport ramp attendant

Education and Training

For most employees in this category, at least some secondary school is required, followed by on-the-job training provided by an employer. For some, grade 12 is recommended or required.

Railway yard workers require experience as a railway labourer as well as a Level "B" Certificate of the Canadian Rail Operating Rules.

While *deckhands* usually start as casual workers and receive on-the-job training, some employers require additional educational, job training or time at sea. Transport Canada issues an Able Seaman certification to persons who acquire 36 months of deck service on a ship and take courses in marine emergency duties. Individuals may receive a Bridge Watchman certificate in one of two ways. One way is for individuals to acquire six months of service on a ship in navigational watchkeeping duties. The other way is to complete applicable courses, including courses in medical emergency duties, offered by a recognized institution and two months of sea service. Transport Canada offers these certificates to commercial mariners after they have successfully completed all prerequisites and examinations appropriate to the level of classification. Post secondary institutions offer courses or programs in navigation, marine engineering, seamanship and shipping and to help individuals prepare for Transport Canada Marine Safety exams. Schools that offer these programs and courses include the British Columbia Institute of Technology's (BCIT) Pacific Marine Training Campus, Camosun College, North Island College and Northwest Community College.

Deck officers of water transport require additional education and training that requires certification. Deck officers require a Watchkeeping Mate certification that includes successful completion, at a recognized institution, of a three-year cooperative cadet training program in navigation, including courses in marine emergency duties and simulated electronic navigation. As well, individuals must pass practical, oral and written examinations, acquire a restricted radio operator's licence and serve two years at sea. BCIT's Pacific Marine Training Campus offers some of these requirements within a 42-month Nautical Science Diploma program.

Engine-room crew workers require an Engine-room Rating certification issued by Transport Canada. This certification includes completion of courses in engine-room duties and marine emergency duties, passing an oral exam and a minimum of three months of service in an engine-room.

Lock and *cable ferry operators* require some secondary school education, then train on the job.

Most companies provide on-the-job training for *boat operators* under the supervision of an experienced worker. Grade 12 with knowledge in mechanics is useful. The University College of the Cariboo, BCIT and Malaspina University College offer technical certificate programs in marine inboard/outboard and small engine repair.

Transport Canada also offers certification to boat operators. A Fishing Master, Fourth-class certification is available to individuals who have a restricted radio operator's licence, completed courses at a recognized institution in marine emergency duties and subjects geared to masters of fishing vessels, and 12 months of service as a master on a fishing vessel. BCIT's Pacific Marine Training Campus, Northwest Community College and North Island College offer a program in Fishing Master Class IV as well as other upper-level (Third, Second and First Class) fishing master programs. These institutions, as well as Camosun College, also offer master and mate training.

Air transport ramp attendants must have experience operating baggage transporting equipment or warehouse experience. A Class 5 driver's licence and a good driving record are usually required, and ramp attendants are generally trained on the job. Northwest Community College offers an introductory course in marine shipping operations through its Marine Studies program.

With technological advances, trains and ships are becoming more complex, so crews need technological experience including a good understanding of machinery and computerized systems. Good health and physical fitness are essential. An ability to react in a safe and effective manner during an emergency is vital. When dealing with the public, good customer relations skills are essential. Strong planning and analytical skills, as well as supervisory and coordination skills, are necessary in order to remain competitive.

Working Conditions

People in this occupational group work around large pieces of machinery and equipment in various working environments. The surroundings are often stressful and can be potentially dangerous, so workers must be alert at all times. These people generally work shifts, which can include night and other shifts, and may work any day of the week, with rotating days off.

Workers often belong to unions, and entry-level workers typically make do with limited work hours from union call-boards before working up to a regular schedule. Collective agreement arrangements between employers and unions often include a union security provision. This requires union membership as a condition of employment.

The average earnings of workers in this group were $32,700 in 1995, which is above the provincial average of $27,900. About half of these workers were employed full time, full year and earned an average of $39,200. This figure is similar to the provincial average for all occupations ($39,400).

There are differences in full-time, full-year workers' average salaries for each type of transport equipment worker. Boat operators earn an average of $40,100 per year. Water transport workers earned from $40,600 to $41,400. Lock and cable ferry operators earned $37,700. Railway workers earned from $35,700 to $48,200. Air transport ramp attendants earned $33,400, on average.

A recent college graduate survey found that entry-level water transport workers earned about $3,000 per month for full-time work. This would provide an annual income of $36,000 for full-time, full-year work. By contrast, new graduates who found work as air transport ramp attendants earned about $1,640 per month for full-time work. This would provide them with an annual income of about $19,700, significantly less than the water transport workers.

This is a large occupational group, which experienced a slight decrease in numbers employed, from 6,190 in 1990 to 5,790 in 1998.

Overall, self-employment among these workers is very low (5%), compared to the B.C. all-occupation average of 15%. Boat operators have the highest rate of self-employment. The proportion of part-time workers (15%) is also below the provincial average rate of 26%. Most of this group work full time (85%), and just under half (48%) work full time for the entire year.

The unemployment rate for this group is just above the all-occupation average, in part reflecting that this work occurs year round. Due to increased traffic in the summer, seasonal workers are needed in passenger transport during these months. Industry sources report that many of the workers filling this seasonal need are students.

Workers in this group are mainly employed in the water transport (25%), rail transport (23%) and air transport (27%) industries. The federal government employs another 13% of these workers.

There is a lower than average share of workers in the Lower Mainland (52%) compared to the workforce regional distribution average of 57%. In addition, there is a higher average share of workers on Vancouver Island (26%), compared to the regional distribution average of 18%. Most water transport and boat operators are concentrated in the Lower Mainland and on Vancouver Island. Railway workers are mainly situated in Northern B.C., the Okanagan/Kootenay region and the Lower Mainland. Air transport ramp attendants are for the most part located in the Lower Mainland.

There are far fewer women (9%) in this work group than the all-occupation average of 46%.

About 11% of these workers are under the age of 25. This small proportion suggests younger workers may have difficulty securing entry-level positions. The bulk of workers in this group are in the 25 to 44 age range (60%). The average age of those employed in this group is the same as the all-occupation average, at 38.

Employment Prospects

This is a large occupational group, made up of about 5,790 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects overall employment in this group to decline at an annual rate of 0.5% from 1998 to 2008. However, as a result of an aging workforce, 970 openings will result from the need to replace workers who retire. This amounts to a total of 680 openings in excess of projected job losses.

Although there are many different occupations in this group (see Example Titles section), about 30% are *air transport ramp attendants*. Employment of these workers is projected to grow at a rate close to the average for all occupations, and 85% of the total projected openings (580 in total) are for positions in this field. Employment in all other occupations in this group is projected to decline.

A major source of uncertainty with the forecast for *air transport ramp attendants* is the restructuring currently underway in the airline industry. In January 2000 Air Canada took over ownership of Canadian Airlines, and the employment effects of this are not yet clear. Although Air Canada has announced that there will be no involuntary layoffs, some industry analysts predict that the number of workers currently working for the two airlines will decline by 10% in the short term. There is disagreement about the longer-term effects that this merger will have on the amount of Canadian air traffic, which, in turn, directly affects the demand for air transport ramp attendants. Some industry analysts suggest that the reduction in competition will push air ticket prices up and consequently reduce the overall amount of air traffic. Other industry sources suggest that the merger will reduce the destructive components of domestic competition among airlines and, in this way, increase the overall efficiency of the airline industry. Some of these savings may be passed on to consumers in the form of lower ticket prices, which may ultimately increase the amount of domestic Canadian air traffic.

One source of employment growth in the air transportation industry is the increased business and personal air traffic from the United States and Europe resulting from growth in their economies. Vancouver is a also a key air transport centre, particularly for Canadian and Northwestern U.S. connections to Asia.

The projected decline in employment in all other occupations within this group is closely related to advances in technology and pressures to become more efficient. Increasingly automated operating and dispatching systems will also result in the need for fewer but more highly skilled workers.

Multi-skilled workers capable of doing several types of work will have the best employment opportunities in this occupational group.

People considering entry into any of these occupations are advised to contact the hiring departments of transport companies for up-to-date information. Listings of employers can be found in the yellow pages under the headings of railroads, ferries, shipping agents and airline companies.

Additional Information

Transport Canada http://www.tc.gc.ca

Related Occupations

- trades helpers, construction labourers and related occupations (76)
- train crew operating occupations (736)
- supervisors, railway and motor transport (722)
- transportation officers and controllers (227)
- fishing vessel deckhands (8441)
- material handlers (in 745 longshore workers and material handlers)
- other attendants in travel, accommodation and recreation (667)
- aircraft load planner (in 6433 airline sales and service agents)

Other Installers, Repairers and Servicers

NOC 744

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	7,800	7,900	9,390

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
1,490	1,800	3,290

Annual Growth 1998-2008 1.7%

Main Industries of Employment

Retail Trade	29%
Construction	29%
Wholesale Trade	10%

Employment by Region

Lower Mainland	52%
Vancouver Island	16%
Northern B.C.	11%
Okanagan/Kootenay	21%

Self-employment 24%

Nature of the Work

This varied group includes workers who install, repair and maintain products and equipment for consumers. This profile includes workers who install prefabricated products and construction elements, such as windows, cabinets and water heaters. It includes specialty repairers who work on items like cameras and bicycles, and automotive servicers, such as muffler and tire installers. It also covers service providers, such as water works and gas maintenance workers and exterminators. These workers are employed in construction, in service shops or by the retail and wholesale companies that sell related products. A few are employed by local and regional governments.

Main Duties

The specific duties of these workers are as varied as the products they repair and service. One common skill these workers must have is the ability to read and interpret plans, blueprints or technical manuals, as they may be called on to install or repair many makes or models of products. In most cases, they provide routine maintenance for products that they have installed. If they have a lot of direct customer contact or are self-employed, they must also be able to prepare estimates for customers.

Residential and *commercial installers* and *servicers* install and service a wide variety of interior and exterior prefabricated products, such as window assemblies, doors, electrical appliances, water heaters, fences, siding, septic systems and signs, at residential or commercial properties. They must use plans and blueprints to decide layout and installation procedures and install the products using hand and power tools.

Waterworks and *gas maintenance workers* build and maintain water and gas utility systems. They are responsible for checking the equipment for leaks and repairing mains and valves. Waterworks workers also clean and lubricate waterworks equipment, such as pumping and chlorination equipment and compressors. Gas maintenance workers also must be able to use special equipment to detect leaks and must provide information and supervision to other workers working near gas lines.

Automotive and *mechanical installers* and *servicers* install replacement automotive mechanical parts, such as mufflers, exhaust pipes, shock absorbers, springs and radiators. They also do routine maintenance, such as oil changes, lubrication and tire repairs, on automobiles, trucks and heavy equipment. They may be required to help mechanics.

Pest controllers and *fumigators* inspect buildings and outside areas for pest infestation and spray chemical treatments to kill insects, rodents and other pests. They use mechanical or electric sprayers to kill insects, rodents and other pests and must prepare the chemical mixtures needed for this purpose. They may also set cage traps to capture and remove animals, such as skunks and raccoons. These workers also prevent re-infestations by cleaning out areas that hide and protect pests, by installing animal control barriers, such as netting, and by advising clients on how to prevent infestations. They are licensed by the provincial government as certified "pesticide applicators and dispensers."

Other repairers and *servicers* covered in this category repair and service a wide variety of products, such as cameras, scales, musical instruments, vending machines, sporting goods and other miscellaneous products and equipment.

These workers must inspect products to find out what repairs are needed and then repair or replace defective or worn out parts. They use a variety of hand and power tools, as well as specialty tools. Job titles of the various installers and repairers often reflect the specialty of the worker.

Example Titles

residential and commercial installers and servicers (7441):

- bicycle repairer
- eaves trough installer
- apprentice cladder
- exterior cladder
- heavy equipment servicer
- kitchen cupboard and vanity installer
- piano repairer
- sewing machine servicer
- shock absorber installer
- swimming pool installer
- vending machine repairer

waterworks and gas maintenance workers (7442):

- gas leak locator
- gas maintenance worker
- pipeline maintenance worker
- pipeline patrolman/woman
- utility plant maintenance worker
- waterworks maintenance worker

auto mechanic repairers and servicers (7443):

- apprentice tire repairer
- muffler installer

pest controllers and fumigators (7444):

- animal control trapper
- exterminator, pests
- fumigator, pests
- pest controller
- pest control technician

other repairers and servicers (7445):

- apprentice air compressor and pneumatic tool mechanic
- apprentice meter technician

Education and Training

Residential and *commercial installers* and *servicers* usually require some secondary school education and a driver's licence. On-the-job training is usually provided, and several months of related installing, repairing or servicing is an asset.

Waterworks and *gas maintenance workers* require some secondary school education and several years' experience as a labourer for the same employer. On-the-job training is provided, and in some cases industry-based training is also available. See the profile Plumbers, Pipefitters and Gas Fitters (NOC 725) for details about piping trade apprenticeships.

Automotive mechanical installers and *servicers* may specialize in a variety of areas. For wheel alignment, brake and frame straightening service technicians, a four-year apprenticeship is common. To work as an automotive radiator manufacturer and repairer, a three-year apprenticeship is usually completed. Those who wish to work as a wheel alignment and brake service technician or a tire repairer usually undertake a two-year apprenticeship. There is no technical training for tire repairers or automotive radiator manufacturers and repairers, but the other apprenticeships include some amount of technical training undertaken at a college, technical institute or training school in B.C. ITAC recommended education prior to starting an apprenticeship is grade 12 or equivalent, including appropriate English, mathematics and science courses. Contact a local ITAC area office for apprenticeship details on these trades.

Vancouver Community College offers an in-school technical training component for a three-year automotive glass technician apprenticeship. In addition to the educational prerequisite of grade 12, apprentices need to be in good health, have normal colour vision and possess a valid driver's licence.

For information about automotive collision repair technicians, automotive service technicians and automotive painting and refinishing technicians, see the profile Motor Vehicle Mechanics (NOC 732).

To work as an *appliance service technician*, a four-year apprenticeship is usually completed. Upon completion of the apprenticeship, an appliance service technician must pass an examination to receive a Certificate of Apprenticeship. ITAC recommended education prior to starting an apprenticeship is grade 12 or equivalent, including appropriate English, mathematics and science courses. More information is available by contacting an apprenticeship counsellor at a local ITAC area office.

Many colleges, university colleges and BCIT offer pre-employment courses in a number of trades, and some of these are relevant for this category of installers and repairers. An Appliance Servicing program is offered at Kwantlen University College, and applicants to this nine-month program require grade 10 or equivalent, and good physical health. Kwantlen University College also has an Appliance Servicing (with English as an Additional Language) Certificate program that is one year long. Camosun College offers a nine-month Major Appliance and Vending Machine Repair Technician Certificate program.

Also included in this profile are *pest controllers* and *fumigators*. To work in this field individuals must acquire a pesticide applicator licence by successfully completing an exam in pest management either before or during training with a certified pesticide company. The Ministry of Environment, Lands and Parks, Pollution Prevention and Remediation Branch can provide detailed information. See the profile Contractors, Operators and Supervisors in Agriculture/Horticulture/Aquaculture (NOC 825) for details about pesticide training opportunities.

Training programs for *other repairers* and *servicers* vary due to the wide range of services involved. Completion of a college program or other courses relevant to a particular product may be required, as well as several months of on-the-job training. For example, cameras are increasingly electronic, and employers favour applicants with a strong background in electronics. Prospective technicians may benefit by taking a provincial common core curriculum in electronics offered by public B.C. colleges, university colleges and BCIT. In addition, camera manufacturers usually provide training specific to their equipment for the staff of camera shops.

In general, these individuals must have an attention to detail, good hand-eye coordination, some mechanical and electrical aptitude, interpersonal skills and, in some cases, physical strength.

Working Conditions

These workers are found in many settings. A high percentage will spend most of their time on construction sites. Some repairers and servicers spend a lot of their time moving between calls at clients' residences. Others, such as *automotive installers* and *specialty repairers*, work out of a shop. *Gas* and *waterworks maintenance workers* do some work out of utility plants but spend much of their time outdoors servicing gas lines and water and sewer mains.

Normally these workers work a 35 to 40 hour week on weekdays, but busy times or deadlines may require overtime and weekend work. Those who work outside, such as *siding installers*, may work longer hours in the summer when there is more daylight and the weather is good. Repairers who work for retail outlets and service centres may have to work evening and weekend hours when shops are open.

Some employers may require service personnel to wear uniforms. Automotive installers and some others may work in areas with a lot of noise and fumes. Many of these workers will be required to move heavy objects. They also must be agile in order to stretch, crouch and reach awkward spots to install and repair equipment.

Workers in this occupation have somewhat below-average earnings, according to 1995 salary information. Many work part time and/or part year, so the average annual salary in this group was only $21,900, below the all-occupation average of $27,900. Workers employed full time for the full year earned an average of $31,000, which is also below the provincial average of $39,400. Recent college graduates who found work in this category reported average monthly salaries of $1,480 per month (full time) for auto mechanic installers and servicers to $2,200 per month (full time) for residential and commercial installers and servicers. For those who work full time for the full year in these occupations, that will mean annual starting salaries of between $17,800 and $26,400. But it must be remembered that many workers in this category start out at minimum wage, and in some types of installation and repair, workers are paid on a piece-work basis.

The salary of different workers in this occupational group varies depending on the specific field. For example, in 1995 an automotive installer who worked full time for the full year earned, on average, $29,000. A full-time, full-year waterworks or gas maintenance worker earned the highest full-year, full-time average salary in this occupational group, at $49,500. Residential/commercial installers earned an average of $28,800 for a full-year, full-time job. The lowest paid workers in this occupational group were the mixed group of "other repairers and servicers" (for example, camera repairers or fence installers). For all these workers, including those employed part time and/or part year, the average annual earnings were only $18,600 on average, and for those employed full time, full year, the average annual earnings were $27,000.

In 1998 there were 7,900 people in this occupational group in B.C., up from 7,800 in 1990. Residential and commercial installers and repairers make up almost half of this group.

Self-employment among this group is common, with 24% who report being self-employed, compared to 15% of the workforce overall. Again, the rate of self-employment varies among the different types of workers in this group. For example, gas and waterworks maintenance workers and automotive installers are unlikely to be self-employed (2%) as they are usually employed by large organizations or companies. On the other hand, 35% of residential and commercial installers are self-employed because it is easier for them to work on contract. Many of them are employed in the construction industry where self-employment is common. Many of those in the other repairers and servicers category also have high self-employment (28%). These workers may also work on contract or operate a retail service.

The amount of part-time and part-year work for these occupations is close to the provincial average. In this case, that means that about 43% of these workers have full-time, full-year jobs. Some of these jobs (for example, those in construction) are subject to seasonal slowdowns and layoffs in the winter, which helps explain why 37% of this group work full time but for only part of the year.

Part-time work is most common among pesticide applicators and miscellaneous servicers. These workers offer specialized services, so demand in some regions may be low. Pest controllers and some servicers (for example, bicycle repairers) will also be affected by seasonal conditions. Waterworks and gas maintenance workers have the steadiest work, with 64% working full-time, full-year jobs.

The unemployment rate in this occupational group overall is higher than the provincial average. Workers in this occupational group are employed across a wide range of industries, but most are concentrated in construction, retail trade and wholesale trade. The construction industry employs 29% of this group overall and 65% of residential and commercial installers. The retail sector also employs 29% of these workers. Many workers employed in retail are automotive and mechanical installers, working in garages and specialty operations, such as muffler or lube shops. Others are miscellaneous servicers, such as camera or sporting goods repairers, who work for sales outlets or repair services.

These workers are less likely than average to live in the urban centre of the Lower Mainland. This is especially true of waterworks and gas maintenance workers, as well as automotive and mechanical installers. Overall, 16% of this occupational group live on Vancouver Island, 21% are in the Okanagan/Kootenay region, 11% are found in Northern B.C., and 52% are in the Lower Mainland.

Only about 6% of workers in this occupational group are women. The two areas with the highest representation of women are pesticide applicators (16% are women) and miscellaneous repairers and servicers (9%).

Overall, these workers are significantly younger than the all-occupation average of 38. This is easy to understand, as many of these jobs require little formal training, and they are often entry-level jobs. If workers learn more skills and take additional training, they can move on to more specialized related work. The average age for workers in this group is 35, and 52% are under 35 years old. In the workforce overall, 40% are in that age group. Gas and waterworks maintenance workers are the exception. At an average age of 41, they are slightly older than the workforce average.

Employment Prospects

This is a large occupational group, with employment estimated at 7,900 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment in this group to grow at an annual rate of 1.7%, about as fast as the average for all occupations. According to this projection, a total of 3,290 positions will become available from 1998 to 2008. As a result of an aging workforce, particularly for this occupational group, over half of these openings are projected to come from retirements. The remainder will come from growth in the number of new positions. Many additional openings will result from worker turnover.

Employment growth for this occupational group is linked to population and economic growth. Average employment growth stems from the variety of workers in this group and the wide range of industries that employ them. Consequently employment projections for different occupations in this group vary considerably.

A little over 40% of the workers in this group are *residential* and *commercial installers* and *servicers*. Employment of these workers is projected to grow faster than the average for all occupations and faster than any other occupation in this group. Consequently almost 60% of the projected openings for this occupational group (1,880 in total) are for positions in this field.

Other repairers and *servicers* account for 23% of this occupational group. Employment of these workers is projected to grow more slowly than the average for all occupations. A total of 500 openings are projected to become available for these workers over the projection period. Declining prices of many of the items that these workers service will continue to make it more common to replace rather than to service or repair them.

Employment of *automotive mechanical installers* and *servicers* will also grow more slowly than the average for all occupations. According to projections, 490 openings will become available for these workers between 1998 and 2008. Employment growth for these workers will continue to be restricted by advances in technology. Parts are becoming more reliable and are requiring less maintenance. Technologies are also causing installation and servicing methods to become more efficient and less labour intensive. Complete component replacement is becoming more common as a servicing technique rather than attempting to repair defective parts.

Only about 10% of the workers in this group are *waterworks* and *gas maintenance workers*. Employment of these workers is projected to grow faster than the all-occupations average, amounting to a total of 360 openings.

Pest controllers and *fumigators* make up the smallest occupation in this group, and employment of these workers is projected to decline. However, a few employment opportunities are projected to become available in this field as workers retire.

These occupations are open to those without much post secondary training and provide workers with on-the-job training. They can also offer young people an entry-level position from which they can gain experience and knowledge of the work before going on to formal post secondary training.

Self-employment is a common route to increased responsibility and earnings. Experience and additional training in business and financial management are often necessary for those planning to run their own businesses.

It may be possible for workers to move into related areas within this large group. However, specific on-the-job training is often necessary, and employers usually prefer experienced workers.

Generally, it is possible for workers in this group to move into supervisory positions with experience. Opportunities overall will be limited for those who do not acquire additional training, however. For example, an automotive installer will need to join an apprenticeship program or go back to school to become a qualified mechanic.

Additional Information

Industry Training and Apprenticeship Commission
http://www.itac.gov.bc.ca

Related Occupations

other occupations related to many or all of the specialties in this group include the following:

- machinery and transportation equipment mechanics (731)
- other mechanics (733)
- supervisors of installers and servicers (in 721 contractors and supervisors, trades)

water and gas maintenance workers:

- water and waste plant operators (in 942 machine operators in chemical, plastic and rubber processing)
- gas fitters (in 725 plumbers, pipefitters and gas fitters)

automotive and mechanical installers and servicers:
- motor vehicle mechanics (732)

Longshore Workers and Material Handlers

NOC 745

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	14,860	19,790	21,490

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
1,700	3,370	5,070

Annual Growth 1998-2008	0.8%
Main Industries of Employment	
Wholesale Trade	19%
Wood Manufacturing	15%
Water Transportation	13%
Employment by Region	
Lower Mainland	65%
Vancouver Island	12%
Northern B.C.	11%
Okanagan/Kootenay	12%
Self-employment	2%

Nature of the Work

These workers lift and move materials, machines, equipment and products. They also drive and operate power cranes and hoists, as well as ensure that weights are used and hook-ups done with safe operating practices. These workers are employed by a variety of companies and warehouses in transportation, shipping, manufacturing, processing, retail and wholesale.

Main Duties

Even though these workers are employed in different environments and may handle various materials, they have some similar duties. Both occupations operate hoisting devices and mechanical equipment to move cargo out of and into railway cars, trucks, ships and vessels. They are increasingly responsible for mechanical maintenance and repair. In addition, both longshore workers and material handlers connect hoses and operate equipment to transfer liquid materials into storage tanks.

Longshore workers load cargo into, and unload and transfer cargo from, ships, scows and other vessels. They operate production equipment, such as forklifts, backhoes and dock cranes, to transfer cargo, such as containers and automobiles. They also transfer materials, such as grain, pulp and paper, potash, chemicals, coal, ore and bulk products, to ships and other vessels. In addition, these workers shore cargo, open and close hatches, clean holds and rig cargo. Industry sources indicate that this group is essentially a collection of trades workers who are involved in the process of loading maintenance.

Material handlers move many different types of materials. They may work at warehouses and docks handling lumber, coal, ore, metals, grain and malt. They may also open containers, fill warehouse orders, assist in inventory and weigh and check materials. Some workers move household appliances and furniture onto and off of trucks or vans.

©Stone/Vancouver

Example Titles

longshore workers (7451):
- dock worker
- ship loader operator
- stevedore
- tanker loader

material handlers (7452):
- forklift driver
- freight handler (except airline)
- furniture mover
- inventory checker
- railway car loader
- apprentice industrial warehouseperson
- warehouse worker

Education and Training

Longshore workers and *material handlers* may require some secondary school education and receive training on-the-job. For longshore workers, having a trade certificate greatly increases the chances of being called for a job. Machinists, millwrights, plumbers, carpenters, welders, electricians and heavy-duty mechanics are some of the major tradespeople involved in maintenance operations on the docks. See the profiles for each of these trades for details about education and skills requirements.

Various types of cranes on the dock and aboard ships also require skilled operators. See the profile Crane Operators (NOC 7371) for more details.

Inventory and record-keeping operations used by these workers are becoming increasingly computerized and require industrial warehousing skills. See the profile Recording, Scheduling and Distributing Occupations (NOC 147) for details about education and training opportunities in industrial warehousing.

Some physical strength is generally required for these workers, especially for material handlers. However, machinery, like the forklift, has dramatically changed the way this work is done and reduced the need for physical strength and endurance.

Working Conditions

These workers are employed in various environments, such as warehouses, moving companies and docks. *Material handlers* usually work in warehouses where it is often dusty and can be hot in the summer and cold in the winter. *Longshore workers* spend their time outdoors on cargo dock areas and on ships and other vessels.

Most of these workers are employed 35 to 40 hours per week. Shifts are available 24 hours a day from Monday through Sunday. These workers spend most of their time operating heavy machinery and performing physical duties, such as bending, reaching, lifting and moving items. Some workers must also wear gloves, hard hats and steel-toed boots.

The average annual earnings of this occupational group were $28,600 in 1995, which is about the same as the all-occupation average ($27,900). Those workers who were employed full time, full year earned an average of $38,900, which is very close to the average provincial wage for all occupations ($39,400). The earnings for longshore workers were significantly higher ($58,600 full time, full year) compared to material handlers ($35,900 full time, full year). The disparity in full-time earnings can be partially explained by the fact that longshore workers have traditionally belonged to a union.

Collective agreement arrangements between employers and trade unions often include a union security provision. This requires union membership as a condition of employment. Entry-level workers typically experience years of less than full-time work hours from union call-boards before working up to a regular schedule. On-call casual labour is sometimes used to help out during peak times. A recent survey of college graduates found that entry-level longshore workers earned an average of $2,760 per month for full-time work. Graduates who found work as material handlers earned about $1,950 per month for full-time work. For recent graduates who find full-time, full-year work in this occupational group, this means annual earnings of between $33,100 and $23,400.

This is a very large occupational group that has increased in numbers employed from 14,860 in 1990 up to 19,790 in 1998. Most of this occupational group (83%) is made up of material handlers, and the remaining 17% are longshore workers.

There is almost no self-employment in this occupational group (2% compared to the all-occupation rate of 15%). Longshore workers and material handlers work for a variety of companies and warehouses.

The rate of part-time work (20%) among these occupations is below the provincial average of 26%. About 45% of these workers are employed full time, full year, and a further 35% are employed full time over part of the year. The unemployment rate for this group is higher than the provincial all-occupation average. Seasonal work may be a factor if handling and shipping companies deal with commodities that are seasonal.

These workers are found in a wide range of industries. The largest numbers are employed in wholesale trade (19%), the wood industry (15%) and water transport (13%). Storage and warehousing work, the retail industry and the transportation industry provide most of the remaining employment opportunities for these workers.

Most workers are located in the Lower Mainland (65%), where large ports and warehouses are located. Vancouver Island has 12% of these workers, Northern B.C. has 11%, and the Okanagan/Kootenay region is home to 12%. Longshore workers are found almost exclusively in the Lower Mainland (75%) or on Vancouver Island (16%).

There are few women (9%) in this occupational group compared to the all-occupation average of 46% in B.C., with a few more women among material handlers (9%) than there are among longshore workers (6%).

The average age of these workers is 36, a little below the provincial average of 38. However, longshore workers as a group tend to be somewhat older, the average age being 44. Overall, this group has a higher than average representation of 15 to 24 year olds (21% compared to the total workforce of 15%). There are also fewer workers in the 45-plus age group than the provincial average. These figures may reflect the fact that this work often requires physical strength.

Employment Prospects

This is a very large occupational group, with employment estimated at 19,790 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment in this group to grow at an annual rate of 0.8%, slower than the average for all occupations. However, because this is such a large occupational group, 5,070 positions are projected to become available from 1998 to 2008. As a result of an aging workforce, particularly in this occupational group, about two-thirds of these openings are projected to come from retirements. The remainder will come from growth in the number of new positions.

Of the two types of workers in this group, over 83% are *material handlers*. Employment of these workers is projected to grow at an annual rate of 1.1%, slower than the average for all occupations. The other group is *longshore workers,* and their employment is projected to decline. Any openings for these workers are expected to come from the need to replace workers who retire. Consequently almost all of the openings projected for this occupational group are for material handling positions.

Material handlers are distributed across a much wider range of industry sectors and are less concentrated in the Lower Mainland than longshore workers. They provide a necessary function in the distribution and movement of many goods, products and parts required for many businesses in both the goods and services sectors.

The new positions projected for these workers are expected to come from the increasing flow of goods into and out of B.C. brought about by globalization. As long as exports and trade remain a vital part of the provincial economy, so will the transportation and distributions industries. For this reason, the demand for these workers will continue to depend on economic and population growth in B.C., as well as with major trading partners, such as the U.S. and Pacific Rim countries. General economic ups and downs may also cause employment fluctuations on a year-to-year basis for these workers.

The slow employment growth projected for these workers is a result of new methods of operation and new technologies that have been incorporated into almost all work functions. These developments have increased efficiency and productivity, resulting in a large decrease in the number of workers required for the same, or even greater, volume of work.

Technology and automation are also changing the way work is done and creating opportunities for multi-skilled workers who increasingly replace staff who retire. Multi-skilled workers are now needed to operate different types of machinery in a workplace that is changing through technology. For example, ships with large automated cranes and lifts are now able to pick up large containers and place them in pre-laid holds. An amount of cargo that used to take an hour to load on a ship can now be loaded in minutes. These are major factors limiting any expansion of employment for longshore workers.

The increased use of computerized inventory control will affect the number of material handlers in warehouses. Shipping companies can install tracking devices in containers and monitor them throughout the transportation cycle. As a result, most material handling positions will require highly skilled workers who have knowledge of computerized inventory and control systems.

With additional training and experience, workers in these occupations may advance to occupations requiring higher skills. Advancement into supervisory positions is possible for those with experience but, as in many other fields, there are fewer supervisory positions than before.

Related Occupations

- trades helpers, construction labourers and related occupations (76)
- heavy equipment operators (742)
- transport equipment operators and related workers (743)
- longshore crane operator (in 7371 crane operators)
- contractors and supervisors, trades (721)

Material handlers are distributed across a much wider range of industry sectors and are less concentrated in the Lower Mainland than longshore workers. They provide a necessary function in the distribution and movement of many goods, products and parts required for many businesses in both the goods and services sectors.

Trades Helpers, Construction Labourers and Related Occupations

NOC 76

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	18,150	18,260	20,840

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
2,580	6,050	8,630

Annual Growth 1998-2008	1.3%
Main Industries of Employment	
Construction	60%
Local and Other Administration	8%
Wholesale Trade	6%
Employment by Region	
Lower Mainland	50%
Vancouver Island	17%
Northern B.C.	12%
Okanagan/Kootenay	20%
Self-employment	9%

Nature of the Work

Employers in almost all industries hire entry-level workers to do tasks requiring little training or to assist more skilled production, construction, operating and maintenance workers. Many do tasks that are needed to make the work of more skilled employees flow smoothly. Handlers, equipment cleaners, helpers and labourers often do routine physical work under close supervision. In order to perform their jobs effectively, *helpers* and *labourers* must be familiar with the duties of workers they help, as well as with the materials, tools and machinery they use.

Main Duties

These workers carry out a range of tasks, depending on their specific work assignment. In many cases their job titles describe their specific responsibilities. Generally, these are junior positions in which the workers are usually directed by those with specialized training and experience.

Labourers and *helpers* perform a broad array of work that is needed to make the work of more skilled employees flow smoothly. They load, unload and move construction and other materials around the worksite, or they unload materials and goods from trucks. They remove rubble and other garbage at construction sites and tend or feed equipment, such as mixers, compressors and pumps. They dig and fill holes where heavy equipment is not practical, dig ditches and trenches using shovels and other hand tools, or they may use rakes to level out a piece of ground before it is paved or planted. They often help in the routine maintenance and repair of equipment.

Many of these workers work on construction and road building sites, and work for municipalities and other governments maintaining streets and public areas. These workers often mix, pour and spread materials, such as concrete and asphalt. They also help heavy equipment operators by signalling them to guide the equipment or by attaching equipment to trucks. They may operate pneumatic hammers, vibrators and tampers, if they are directed to do so. *Flagpersons* direct traffic at or near construction sites.

Public works labourers work for various levels of government, including municipal governments. Like other labourers, they help maintain streets, sidewalks and public buildings. They clean and maintain sidewalks, streets, roads and public grounds, sweep litter and shovel snow from sidewalks, and spread sand or salt on walkways for snow and ice control. They also perform gardening and landscaping chores, such as cutting lawns and grass, trimming branches and applying fertilizer. Public works labourers also collect and load refuse and recyclable material on garbage trucks.

Railway labourers do the same kind of work for rail companies, helping to maintain railway tracks, cutting back brush from railway tracks and making sure freight cars are clean and in good repair. *Motor transport labourers* in transport companies perform labouring duties in warehouses, such as loading and unloading trucks.

Trades helpers help skilled tradespeople and various mechanics by performing specialized support duties. For example, a carpenter's helper would measure and cut wood, help install cabinets and lend a hand with other carpentry tasks. A bricklayer's helper would move bricks, help lay them out and mix the mortar. Mechanics' helpers may assist in repairing, maintaining and installing machinery and equipment or help in repairs of aircraft, railway cars, automobiles and heavy equipment.

Example Titles

construction trade helpers and labourers (7611):

- bricklayer helper
- carpenter's helper
- concrete mixer helper
- construction helper
- construction labourer
- construction trades helper
- demolition worker
- equipment cleaners
- drywall sander
- glazier helper
- labourer, concrete paving
- labourer, excavation
- plumber's assistant
- roofer helper
- trades helper

other trade helpers and labourers (7612):

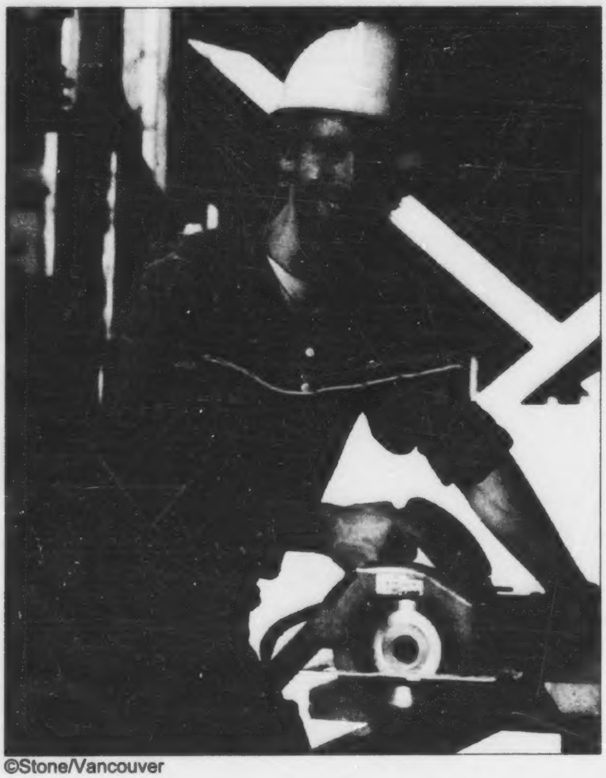
- aerial spraying assistant
- aircraft mechanic helper
- cable installer helper
- diesel mechanic helper
- ground worker, telecommunications
- mechanic's helper, automotive
- millwright helper
- surveyor helper

public works and maintenance labourers (7621):

- asphalt worker, road
- flagman/woman
- garbage collector
- parking meter collector
- municipal labourer
- public works labourer
- road maintenance worker
- sewer maintenance worker
- sidewalk cleaner, manual

railway and motor transport labourers (7622):

- car checker, railway
- furniture mover helper
- motor transport labourer
- moving van helper
- railway labourer
- signal gang helper
- truck driver helper



©Stone/Vancouver

Education and Training

Workers in this area require some secondary school education and may require grade 12. They receive on-the-job training.

Construction workers may need to have basic construction skills and complete safety courses in addition to on-the-job training.

Traffic control persons (flagpersons) may also need to take courses in traffic control or flagging offered by B.C. colleges and university colleges. The Ministry of Transportation and Highways is currently developing a standardized curriculum for traffic control training and certification. Traffic control persons must be comfortable working near traffic and construction equipment, able to tolerate constant noise and able to remain calm in emergency situations.

Pipeline workers in oil and gas pipeline construction usually require one season of relevant experience.

Carpenter's helpers are usually trained in the workplace by an experienced carpenter. A helper must be able to use basic hand and power tools and read instructions and possibly blueprints, depending on the work site. Basic mathematics skills may be required in order to measure and cut wood and materials to fit a design.

Entry-level programs in carpentry are offered at most provincial colleges, university colleges and the British Columbia Institute of Technology (BCIT). In most cases grade 10 or equivalent is required, although grade 12 is preferred. Upgrading is available at most colleges or schools.

Electricians' helpers must be able to follow written and verbal instructions and should be able to read blueprints. They also require good mathematics skills. To remain competitive in this field, workers should be willing to upgrade their skills continually.

For those who wish to become a *brick mason's helper* it is useful to take woodworking and construction classes in high school. Mathematics, mechanical drawing and blueprint reading are all useful courses.

Painters' helpers who take courses in art, shop, mathematics and English will have the basic skills needed to perform well in this position.

Motor vehicle mechanic helpers may want to complete an entry-level program in mechanics. Appropriate programs are available at most provincial colleges, university colleges and BCIT.

Assistant autobody repairers learn on the job with a skilled autobody repairer. Strong mathematics skills, manual dexterity and an ability to read repair manuals are needed.

Public works and *maintenance labourers* and *railway* and *motor transport labourers* usually require grade 12 and several weeks of on-the-job training. An ability to read blueprints is helpful, and comfort with computer use is advisable. Those with relevant post secondary education and work experience will probably have the best chances for advancement.

Workers in this field must be physically fit and may require a driver's licence. Communications skills and an ability to work with others are also needed.

Working Conditions

Working conditions for these workers vary, depending on their specific duties. Most of these workers spend a lot of time outside. Others work in repair shops or in industrial or commercial buildings, such as warehouses. Most jobs require workers to be physically strong and in good general health. Working conditions are frequently noisy, with unpleasant fumes, and workers can expect to get dirty by the end of the day. Working with and around heavy equipment and power tools can be dangerous. Many will need to wear safety equipment, such as hard hats and safety boots. Some employers supply hard hats. Workers usually provide their own boots and, in some cases, their own hand tools.

The work week is usually 35 to 40 hours on weekdays, though evening and weekend work may be expected, especially when deadlines need to be met. As these workers are generally paid by the hour, overtime means extra money. However, labourers are quite vulnerable to layoffs and seasonal work. They are often the first to be let go when work slows down, because they usually have less seniority and training.

Workers in these occupations have below-average earnings, according to 1995 wage estimates. The average wage of all workers in this category, including part-year and part-time work, is $18,600 (compared to a workforce average of $27,900). Workers employed full time for the full year earn an average of $32,300. By comparison, the all-occupation average for full-time, full-year work is $39,400. Railway labourers make up the smallest group in these occupations, but they earn the highest full-time, full-year wages ($37,300), while those employed as helpers in other trades earn the least ($27,800 full time, full year).

This is a very large group of workers. In 1998 there were 18,260 people in this occupational group in B.C., up slightly from 18,150 in 1990. General labourers, mostly in construction, make up 72% of this group. Public works labouring positions employ 19% of the total, 6% work as trades helpers, and only about 4% work as railway and transport labourers.

Self-employment among this group is less common than in the workforce as a whole, which is especially unusual for construction occupations. Only 9% of these workers report being self-employed, compared to 15% of the workforce overall. In many construction jobs workers can contract out or offer their services directly to property owners. Labourers in this category, however, don't have as many of these opportunities. Homeowners, for instance, often choose to do general labour work themselves, because it requires fewer specialized skills.

There is an average proportion of part-time workers in this group, with about 27% of workers working part time. (The B.C. workforce average is about 20%.) There is a very high rate of full-time, part-year work. Only 26% of labourers and helpers work full time for the full year. Labourers who work for other trades as helpers, or in public works, have a better chance of securing full-time work (about 33% work full time, full year). These workers are more likely to belong to a union. Construction labourers are the least likely to secure full-time, full-year employment (11%).

The unemployment rate among labourers is almost three times higher than the provincial average. It is higher among construction labourers than it is among other labourers. Again, this is partly due to the seasonal and cyclical nature of the construction industry. When the weather is good and the economy is strong, the demand for construction workers peaks, but workers employed in all types of jobs in the construction industry face seasonal layoffs and gaps between projects and often find that they have to move around to find enough work.

Labourers and *helpers* are employed in most types of industry in the province. The construction industry employs a large share of these workers, almost 60%. Other industries employ much smaller proportions of this group, because many businesses and organizations need at least a few labourers. The second largest employer is local and provincial government, employing 8% of these workers.

In B.C. these workers are slightly less likely than average to live in cities. Of this group, 50% work in the Lower Mainland region (compared to a workforce average of 57%), and Vancouver Island has slightly fewer than average, at 17%. The remaining two regions have more than the workforce average proportion of workers, with 20% in the Okanagan/Kootenay region (average 15% for the workforce) and 12% in Northern B.C. (average 10%).

About 10% of these workers are women. Public works and the construction industry both employ slightly higher proportions of women than the railway industry and other trades.

Compared to other occupations, these workers are noticeably younger. Their average age is 34. About 50% are under 35 years old. Of these workers, 22% fall into the 15 to 24 age category, compared to 15% of the total workforce who are under the age of 25. These are often entry-level jobs that require little formal training. Many people start as labourers or helpers and work until they have gained experience and training, then move on to better-paying jobs with more responsibility.

Employment Prospects

This is a very large occupational group, estimated as having over 18,000 workers in B.C. in 1998. It is projected to grow more slowly than the average for all occupations, but because it is such a large group, it will still provide many job openings. Between 1998 and 2008 a total of 8,630 openings are expected province-wide in this field, resulting both from approximately 2,600 newly created jobs and from over 6,000 replacement jobs for those workers who are retiring. There will also be many openings resulting from turnover, as people move from job to job.

The largest portion of this occupational group is *construction trades helpers* and *labourers*. Over half of the projected job openings from 1998 to 2008 will be for construction labourers. Of total newly created jobs, over two-thirds will be for construction trades labourers. Even though there are a large number of job openings for labourers and helpers, the unemployment rate is high, particularly for construction labourers. Construction labourers who have experience and highly valued skills will have the most opportunities for work.

Other jobs covered in this category include railway, mechanical and industrial labouring jobs. These jobs are growing faster than the all-occupational average. This group represents about one-tenth of this large occupational group.

The number of *public works* and *maintenance labourers* jobs are increasing at a rate much slower than the all-occupational average. Of those jobs that do become available, almost 87% will be to replace workers who are retiring. There is stiff competition for permanent jobs, especially the more secure, better-paying jobs, such as those in public works.

Obtaining a labouring or assistant position can be a good way to get experience and enter the related industries. These positions are among the few areas open to workers who do not have much formal education. These jobs may also help younger workers explore areas of interest, which can then help them choose further training. In many cases, apprentices are selected from the ranks of labourers already working for a company, and apprenticeship can be a good option for those who are interested in entering a skilled or technical job and do not have other college or trades training. However, people entering this type of work should be prepared for demanding physical labour and the difficulty involved in finding steady work.

Most labourers and helpers can move between related jobs within an industry. Public works and railway workers may be able to move into more senior positions (such as equipment operator or yard worker) with experience. Most labourers and helpers need to take additional training to move into skilled trades.

Related Occupations

- primary production labourers (861)
- labourers in processing and manufacturing (961)
- heavy equipment operators (742)
- railway yard workers (in 743 transport equipment and related workers)
- other installers, repairers and servicers (744)
- longshore workers and material handlers (745)
- apprentice carpenter (in 727 carpenters and cabinetmakers)
- apprentice, other trades (in 729 other construction workers)

Obtaining a labouring or assistant position can be a good way to get experience and enter the related industries. These positions are among the few areas open to workers who do not have much formal education. These jobs may also help younger workers explore areas of interest, which can then help them choose further training.

© Stone/Vancouver

8 - OCCUPATIONS UNIQUE TO PRIMARY INDUSTRY

Skill Level B - Technical, Paraprofessional and Skilled Occupations

822 Supervisors, Mining, Oil and Gas 516
823 Underground Miners, Oil and Gas Drillers and Related Workers 519
8241 Logging Machinery Operators 522
825 Contractors, Operators and Supervisors in Agriculture, Horticulture and Aquaculture 525
826 Fishing Vessel Masters and Skippers and Fishermen/women 529

Skill Level C - Intermediate Occupations

841 Mine Service Workers and Operators in Oil and Gas Drilling 532
8421 Chainsaw and Skidder Operators 535
8422 Silviculture and Forestry Workers 537
8431 General Farm Workers 540
8432 Nursery and Greenhouse Workers 542
8441 Fishing Vessel Deckhands 544

Skill Level D - Labouring and Elemental Occupations

861 Primary Production Labourers 546

Supervisors, Mining, Oil and Gas

NOC 822

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	1,170	850	1,000

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
150	90	240

Annual Growth 1998-2008	1.6%

Main Industries of Employment

Metal Mining	35%
Services Incidental to Mining	32%
Coal Mining	9%

Employment by Region

Lower Mainland	15%
Vancouver Island	11%
Northern B.C.	30%
Okanagan/Kootenay	44%

Self-employment	10%

Nature of the Work

Supervisors in this unit group supervise and coordinate the activities of workers engaged in mining operations and drilling for oil or gas. They are employed by coal, metal and non-metallic mineral mines, by oil and gas drilling and well service contractors and by petroleum producing companies.

Petroleum and natural gas make up about one-third of the total value of mineral production in B.C. Coal accounts for about one-quarter of the total production. Other important minerals mined in B.C. include copper, gold, zinc, molybdenum, silver and lead.

Main Duties

Supervisors in this group coordinate and schedule the activities of workers as well as establish methods to meet work schedules. Responsibilities include training workers in job duties, safety procedures and company policies.

Mining and *quarrying supervisors* make up about two-thirds of workers within this group. Supervisors coordinate workers who extract coal, minerals and ore. They discuss problems with management and technical personnel in order to ensure efficient and safe operations.

Oil and *gas drilling* and *services supervisors* coordinate workers who drill for oil and gas. They may set up machines and equipment. They also prepare personnel reports and recommend measures to improve productivity.

Example Titles

supervisors, mining (8221):
- fill foreman/woman
- level boss
- mine foreman/woman
- mine supervisor
- shift boss
- track boss
- yard boss

supervisors, oil and gas drillers and services (8222):
- fracturing supervisor
- multi-service operator
- rig manager
- tool pusher
- well services crew supervisor

Education and Training

Supervisors in the mining industry may require completion of grade 12, plus approximately ten years' experience in a relevant occupation. With the increased application of new technologies, mining companies are recruiting people who have completed a college or university program in mining technology or engineering. With on-the-job training and experience, these recruits are likely to move into supervisory positions.

All supervisors working in areas covered by the Mines Act of B.C. must be certified under the Health, Safety and Reclamation Code for Mines in B.C. Specific information about certification is available from the Ministry of Employment and Investment.

The British Columbia Institute of Technology (BCIT) offers a two-year Mining Diploma program, which provides the technical knowledge and skills necessary to work in the mining industry. Admission requires grade 12, with English and mathematics 12, and either physics 11 or chemistry 11. Students who successfully complete the four academic terms and a work placement are also eligible for a Mining Industry Work Experience Certificate from the Mining Association of B.C.

For technologists who want to move on to supervisory and management responsibilities in the engineering technology areas of mining, BCIT offers an advanced diploma in technology management and a bachelor's degree in Technology (Technology Management).

The University of British Columbia (UBC) offers a bachelor's degree in Applied Science (Mining and Mineral Process Engineering). Admission requires graduation from grade 12, with mathematics, physics and chemistry. Admission is based on academic standing and enrollment is limited. UBC also offers graduate studies in Advanced Technology Management for students who wish to develop advanced management skills suited for high technology companies. Admission requires a four-year bachelor's degree in applied science.

To become a supervisor in the Oil and Gas industry, completion of secondary school is required. Drilling supervisors, including rig managers and tool pushers, must complete college or courses for drillers and supervisors. Extensive experience in the occupation to be supervised is also required. Courses and certificates in various safety subjects are usually part of on-the-job training.

Northern Lights College offers a Power Engineering and Gas Processing Certificate program that provides the entry-level training necessary to work in the oil and gas industry. Graduates' credentials must include a fourth class and part A of third class Power Engineering, all four levels of Gas Processing Technology (jointly certified by the Southern Alberta Institute of Technology), plus a number of safety and environmental certificates. They are then able to progress to higher levels of certification, such as first and second class power engineering. Applicants to the program must be at least 18 years of age (grade 12 is recommended) and must successfully complete a college entrance examination and attend an interview.

For additional information about power engineering, see the profile Stationery Engineers and Power Station and System Operators (NOC 735).

BCIT offers a two-year diploma program in Petroleum and Natural Gas, which addresses all the major aspects of the oil and gas industry, including the use of computers. Admission requires grade 12, with English and mathematics 12, and either physics 11 or chemistry 11.

Supervisors in this area generally need to have an aptitude for mechanics and electricity along with leadership abilities. They must be observant, responsible and able to enforce rules and regulations. Effective communication skills are needed. Good health, manual dexterity and physical stamina are important. Prospective supervisors should be comfortable working independently or as part of a team.

Working Conditions

Supervisors are responsible for the safety of all workers and for the activities that occur at the site. They spend their day supervising workers as well as overseeing safety and production from on-site offices.

Working conditions are sometimes challenging. Supervisors work around heavy machinery and equipment. All mines and drilling sites in B.C. follow strict safety procedures, and workers are required to wear gloves, hard hats and steel-toed boots.

Shift work is common. A typical shift will vary from 8 to 12 hours, depending on the employee's position and the location of work. Supervisors often belong to unions where seniority may play an important part in obtaining shifts. If the work site is remote, extensive travel may be required. In some cases mining supervisors may travel to sites outside of Canada.

The estimated average earnings for all mining, and oil and gas supervisors in B.C. were $56,900 in 1995. The comparable all-occupation average for B.C. was $27,900. Those working full time for the whole year in mining and quarrying earned an average of $65,200. Those working full time for the whole year in oil and gas drilling earned an average of $58,500. These figures are well above the provincial average of $39,400 for full-time, full-year workers, which reflects the responsibilities that go to the supervisor and the fact that these are not entry-level positions.

This is a very small occupational group. In 1998, there were 850 people employed in these positions in B.C., down 27% from 1,170 in 1990. Mining supervisors make up 71% of this group, and oil and gas supervisors make up 29%.

Self-employment for supervisors in mining (6%) is below the 15% provincial average. However, self-employment for supervisors in oil and gas drilling is higher at 17%. This is full-time work with part-time work almost non-existent. About 96% of supervisors in mining work full time, with 70% employed on a full-time, full-year basis. Supervisors in oil and gas are more affected by seasonal factors. While 95% work full time, 50% are employed on a full-time, part-year basis.

Unemployment in 1996 for supervisors in mining was below the average for all occupations, but it was higher than the provincial average for supervisors in oil and gas drilling. Overall, it is fair to say that employment in these occupations is tied closely to changes in the business cycle.

Mining supervisors are employed in metal mining (50%), mining services industries (14%) and coal mining (13%). Oil and gas supervisors are employed in petroleum and gas mining (14%) and mining services industries (73%).

Mining supervisors are mainly located in the rural areas of the Okanagan/Kootenay (54%) and Northern B.C. (22%), close to the active mining operations. Oil and gas supervisors are located mainly in Northern B.C. (55%).

This occupational group has traditionally been dominated by men. Women make up less than 2% of all workers.

In both of these occupations, there are few workers under the age of 25 (about 2%), which reflects the years of experience needed to perform the work involved. The supervisors in mining tend to be older than average, with 53% of the workers between the ages of 45 and 64, compared to just 30% for the workforce as a whole. Their average age is 44. The supervisors in oil and gas drilling tend to be younger, with 47% of these workers between the ages of 35 and 44. Their average age is 39.

Employment Prospects

This is a very small occupational group, made up of only about 850 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment in this group to grow at an annual rate of 1.6%, about as fast as the average for all occupations. According to this projection, 240 positions will become available from 1998 to 2008. Almost 40% of these openings are projected to come from retirements. The remainder will come from growth in the number of new positions, most of which are expected for *supervisors, oil* and *gas drillers* and *services*. Employment of these supervisors is projected to grow much faster than the average for all occupations.

About 70% of this overall group are *supervisors, mining* and *quarrying*. However, because of slower than average employment growth of these workers, only 38% of the projected openings (90 in total) are for positions in this field. The majority of projected openings (150 in total) are for supervisors in oil and gas drilling and service.

Rapid employment growth of supervisors in the oil and gas drilling and service industry is linked to the expected high employment growth in the oil and gas industry. Industry officials expect that the planned $25 billion of investment over the next ten years will result in a doubling of gas and oil production. As of the middle of the year 2000 strong oil and natural gas prices and growing world demand are providing an additional boost to exploration investments. The provincial government also has recently announced a series of royalty and regulatory initiatives with the goal of doubling natural gas production and increasing investment in B.C.'s oil and gas industry. Employment growth in this industry is unlikely to match its growth in production, however, as production expansion will only be partly due to additional exploration finds, which are more labour intensive. Much of the additional production will come from expansion, development and production of already found oil and gas deposits.

B.C. also has vast reserves of oil and gas off its northern coast that have been off limits for oil and gas companies for almost 30 years because of federal and provincial bans on offshore drilling. There is growing pressure from coastal and northern communities to lift this moratorium on offshore exploration. Such a policy change could result in significant additional employment growth for supervisors in the oil and gas drilling and service industry.

There are several factors responsible for the sluggish employment growth of supervisors in the mining and quarrying industry. Almost all of these supervisors are employed in mining. Employment in mining decreased during the 1990s with the closure of 14 mines. Employment for supervisors in mining is expected to be flat through to 2008. According to industry sources, exploration spending fell by more than 50% from 1997 to 1998 and is now at a level that is insufficient to maintain the current level of mining activity. However, mining exploration activity has been rising to date during the first half of the year 2000. Another negative factor for mining employment prospects is that the amount of land available for mining is declining because of increasing environmental concerns, and potentially costly environmental challenges in some cases can be a factor in not pursuing potentially viable mining operations. Environmental concerns have also resulted in a growing proportion of B.C.'s land resource being designated for parks or otherwise protected.

The mining industry is sensitive to changes in the business cycle. Many B.C. minerals are exported, and the prices for most minerals are set in international markets. Increases in international supply of minerals by other countries that have lower extraction costs has had an adverse impact on B.C.'s mining industry. Supervisors are less affected by changes in the business cycle than are employees in entry-level positions.

The oil and gas industry is affected by changes in the business cycle but generally less so than mining. World oil prices are mainly set by the Organization of Petroleum Exporting Countries (OPEC). Although these prices are variable, they tend to be less variable than mineral prices. However, the oil and gas industry is somewhat affected by seasonal factors. As exploration and drilling is generally limited to Northern B.C. east of the Rocky Mountains, oil and gas companies do most of their drilling in the winter when the ground is frozen.

Technological advancements have led to higher production levels with fewer workers. These improvements make operations more efficient and more economical, which means increased competition between companies and higher demand for multi-skilled workers.

Mobility among surface mining, underground mining and coal or metal mining industries is limited by the differences in production technologies and licensing requirements. However, supervisors may move from one employer to another in the same sector, especially if they have post secondary diplomas or degrees.

Additional Information

For *mining and quarrying supervisors*

Mining Association of B.C.
http://www.mining.bc.ca

Mining Industry Training and Adjustment Council
http://www.mitac.ca

For *oil and gas drilling and services supervisors*
Canadian Association of Oilwell Drilling Contractors
http://www.caodc.ca

Petroleum Services Association of Canada
http://www.psac.ca

Related Occupations

- mining engineers (214)
- machinery and transportation equipment mechanics (731)
- driller and blasters - surface mining, quarrying and construction (7372)
- motor vehicle and transit drivers (741)
- heavy equipment operators (742)
- underground miners, oil and gas drillers and related workers (823)
- mine service workers and operators in oil and gas drilling (841)
- primary production labourers (861)
- central control and process operators in manufacturing and processing (923)

Underground Miners, Oil and Gas Drillers and Related Workers

NOC 823

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	1,050	1,210	1,330

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
120	300	420

Annual Growth 1998-2008	0.9%
Main Industries of Employment	
Metal Mining	42%
Services Incidental to Mining	33%
Coal Mining	14%
Employment by Region	
Lower Mainland	7%
Vancouver Island	21%
Northern B.C.	24%
Okanagan/Kootenay	48%
Self-employment	4%

Nature of the Work

These workers are responsible for operating various pieces of machinery and equipment for blasting, construction, exploration, extraction and research at mining and drilling sites. Workers sometimes operate specialized mechanical or electronic equipment, tools or instruments to collect data.

Miners are employed by mining companies and specialized contractors in mine construction, shaft sinking and tunneling. Well drillers and servicers are employed by service contractors, petroleum producing companies, oil companies and well-logging or testing companies.

Main Duties

Both these groups of workers spend most of their day performing physical duties. Working conditions can sometimes be difficult and hazardous.

Underground miners operate drilling machines to produce designated blasting holes, test geological formations or produce underground passageways. Their activities also include working with explosives, operating load-haul-dump (LHD) machines and maintaining mining machinery. These workers may also be required to install air and water pipes, scale loose rock and construct timber supports and cribbing.

Oil and *gas well drillers* and *well servicers* direct rig crews in setting up for exploration and operate controls for drilling and hoisting machinery. Their activities include operating recorders and computers to collect data, maintaining operation records and some data interpretation. In some cases, workers drive well service or wireline trucks to and from well sites. Most of the oil and gas activity in B.C. is in the northeast part of the province.

©Stone/Vancouver

Example Titles

underground miners (8231):

- blaster, underground mining
- chute blaster
- diamond driller, underground mining
- drift miner
- driller, underground mining
- faceman/woman, coal mine
- jumbo drill operator
- miner
- mining machine operator
- mucking machine operator
- raise miner
- scooptram operator

oil and gas well drillers and well servicers (8232):

- assistant driller
- directional drilling operator
- downhole tool operator
- drill stem tester
- driller
- electric line operator
- logging and perforating operator
- service rig operator
- slickline operator
- wireline operator
- well testing operator

Education and Training

Workers in this occupational group must be at least 18 years, old with a minimum of grade 10. Grade 12 is preferred by most employers.

Underground mining occupations are generally considered to be skilled fields. The equipment and techniques used are varied and complex, with many areas requiring significant safety and skills training. There is, however, no specific post secondary education required for employment in these occupations, and training is usually provided on the job. An ability to work in an underground environment is one of the most important requirements.

Training for *hardrock miners* is on the job or in a simulated setting. Length of training depends on the complexity of the skills required and the company. Several years of experience are generally expected for more senior and higher-paying jobs or for employment with development crews.

To become a *blaster* within the mining industry in B.C., a permanent blasting certificate issued by the Ministry of Energy and Mines is required. (An incidental certificate can also be issued, primarily for safety fuse detonation.) Prospective blasters must be at least 18 years of age and must work as an assistant under the supervision of a certified blaster for a period of three months to a year. A written examination must be passed and an inspector must be satisfied that the applicant is qualified to perform the duties. Preparation for this exam includes both on-the-job training and study of theory about explosives and blasting, which is supplied in study guides compiled by the Ministry of Employment and Investment. An applicant is allowed to write the exam upon recommendation of a mining company. Blasting certificates issued by other organizations, such as the Workers' Compensation Board, are helpful in understanding the theory of explosives.

Employment as a *surface (rock and soil) mining driller* usually requires three months to two years of on-the-job training and related experience. Many companies prefer that a driller work for at least a year as a miner to become familiar with mining techniques.

High school graduation is usually the minimum education necessary for *rotary well-drilling* and *related occupations*. Between five to ten years of on-the-job training and experience in other positions on the drill crew are normally required before becoming a rotary driller.

The British Columbia Institute of Technology (BCIT) offers a two-year Technology diploma with a mining option, which covers all aspects of the industry, including preparation for diamond drilling and blasting (although it does not confer a blasting certificate).

BCIT also offers a two-year Petroleum and Natural Gas program. This program is designed to cover all aspects of the petroleum industry. Admission requires grade 12, with algebra 12 and physics 11 or chemistry 11.

Generally, these workers require some mechanical ability, basic analytical skills and good communication skills. Basic knowledge of computerized systems may be required. Independence, adaptability and an ability to respond effectively to problems and emergencies is necessary. An ability to follow precise instructions, obey safety regulations and work as a member of a team are essential. In addition, blasters must have good hearing, eyesight and manual dexterity and be emotionally stable. Drillers also require manual dexterity and a capacity to stoop and crouch in order to set up drilling equipment. Rotary well drillers need enough strength to push heavy piping and must be able to work in awkward positions. Often these workers must be able to adapt to unpleasant atmospheric conditions.

Working Conditions

Underground mining occurs in a unique work environment. It requires work in dark and damp conditions with varying temperatures. Those employed in this group may also work alone, in small areas, with little supervision or communication.

Oil and *gas work* takes place outdoors, and workers are vulnerable to all kinds of weather. Workers should be prepared to spend their days at a noisy and dusty or muddy work site. In addition, workers may also have to move from location to location in the search for oil. Working conditions are sometimes difficult. All workers are required to follow strict safety codes and must wear gloves, eye protection, hard hats and steel-toed boots.

Although workers spend most of their day performing physical duties, these are jobs that demand mental alertness as well. Mistakes can be very costly and dangerous. Workers must be able to come together as a team to ensure the safety of all crew members.

Rotating shift work is usual. A typical shift may vary from 8 to 12 hours depending on the worker's position and the location of the work. Workers often belong to unions, where seniority may be important in obtaining shifts. In the case of smaller operators, work may be on a contract-to-contract basis, and layoffs may occur in between.

The estimated average earnings for all B.C. workers in this group were $45,100 in 1995. Workers employed full time, full year earned an annual average of $54,800. Both figures are above the provincial averages of $27,900 and $39,400 respectively, which in part reflects a higher compensation for challenging working conditions. Underground miners have slightly higher average wages than do oil and gas well drillers.

This is a small occupational group. Employment increased 15% from 1,050 in 1990 to 1,210 in 1998. The majority of these workers (83%) are underground miners. Due to the nature of the work, self-employment is almost non-existent at 3% for underground miners. However, the statistics show that 9% of oil and gas drillers are self-employed, still below the provincial average (15%).

These occupations provide full-time work. About 93% of the workers in both occupations are employed on a full-time basis, which compares with 74% for the provincial all-occupation average. In the case of underground miners, 51% work full time, full year, and 42% work full time for part of the year. In contrast, only 27% of oil and gas drillers work full time, full year, and 71% work full time for part of the year. Overall, part-time work is limited to only 7% of the workers. This may be due to the need for skilled and experienced equipment operators and the fact that some operations are kept running 24 hours a day. In addition, some work sites are remote and may require travel and/or camp accommodation, a situation that does not allow easily for part-time workers.

The unemployment rate for underground miners is about the same as the average for all occupations. However, it is higher than the average for oil and gas drillers, servicers, testers and related occupations. This reflects the seasonal nature of work in the oil and gas sector. Overall, this group of workers is also vulnerable to changes in business cycles, and fluctuating commodity prices can affect employment levels drastically.

Those working as underground miners are mainly employed in metal mining (50%). Other areas of employment are services related to mining (27%) and coal mining (16%). Those working in oil and gas drilling are mainly employed in services incidental to mining (64%). Other areas of employment are crude petroleum and natural gas drilling (18%) and professional business services (13%).

Most of these workers are located in the rural areas of the province. For miners, 52% are located in the Okanagan/Kootenay region, 25% are on Vancouver Island, and 17% are in Northern B.C. The oil and gas drillers are mainly located in Northern B.C. (58%), with some workers also in the Okanagan/Kootenay region (29%).

There are very few women (5%) in this occupational group.

For miners, there are fewer than average workers under the age of 25 (7%) and a higher than average proportion of workers in the 35 to 44 age group (33%). The comparable figures for the average of all occupations are 15% under 25 and 28% between the ages of 35 and 44. This suggests that few of these occupations are entry-level positions and that many workers probably start as general labourers and then move into these positions after they have gained other related on-the-job training. In the case of oil and gas drillers, the proportion of workers under 25 is 17%, which suggests that some of these positions are entry level. However, this is also a very experienced labour force. About 71% of the oil and gas drillers are between the ages of 35 and 54, compared to only 49% for the B.C. all-occupation average.

Employment Prospects

This is a small occupational group, made up of about 1,210 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment in this group to grow at an annual rate of 0.9%, slower than the average for all occupations. According to this projection, only 420 positions will become available from 1998 to 2008. About 70% of these openings are projected to come from the need to replace workers who retire. The remainder will come from growth in the number of new positions.

Over 80% of the workers in this occupational group are *underground production* and *development miners*. However, because of slower than average employment growth, only 69% of the projected openings (290 in total) are for positions in this field. The remainder (130 in total) are for *oil* and *gas well drillers, servicers, testers* and *related workers*. Employment of these workers is projected to grow much faster than the average for all occupations.

Rapid employment growth for oil and gas well drillers, servicers, testers and related workers is linked to the expected high employment growth in the oil and gas industry. Industry officials expect that the planned $25 billion of investment over the next ten years will result in a doubling of gas and oil production. According to industry analysts, an average of 400 oil and gas wells were drilled annually in B.C. over the past decade. They estimate that as many as 700 wells will be drilled in the year 2000 and that this is the beginning of an upward trend. The provincial government also recently has announced a series of royalty and regulatory initiatives to assist the goal of doubling natural gas production and increasing investment in B.C.'s oil and gas industry.

B.C. also has vast reserves of oil and gas off its northern coast that have been off limits for oil and gas companies for almost 30 years because of federal and provincial bans on offshore drilling. There is growing pressure from coastal and northern communities to lift this moratorium on offshore exploration. Such a policy change could result in significant additional employment growth for oil and gas well drillers, servicers, testers and related workers.

There are several factors responsible for the sluggish employment growth of underground production and development miners. Employment in mining decreased during the 1990s with the closure of 14 mines. Employment for underground production and development miners is expected to see little change through to 2008. According to industry sources, exploration spending fell by more than 50% from 1997 to 1998 and is now at a level that is insufficient to maintain the current level of mining activity. However, mining exploration activity has been rising to date during the first half of the year 2000. Another negative factor for mining employment prospects is that the amount of land available for mining is declining because of increasing environmental concerns, and potentially costly environmental challenges in some cases can be a factor in not pursuing potentially viable mining operations. Environmental concerns have also resulted in a growing proportion of B.C.'s land resource being designated for parks or otherwise protected.

The mining industry is sensitive to changes in the business cycle. Many B.C. minerals are exported, and the prices for most minerals are set in international markets. Increases in international supply of minerals by other countries who have lower extraction costs has had an adverse impact on B.C.'s mining industry. The oil and gas industry is affected by changes in the business cycle but generally less so than mining.

Skill requirements are changing within this group. Employees need higher education levels and a broader range of skills. New mining methods and the development and adoption of new technology will result in a demand for more highly skilled workers in this occupational group. Technological changes have led to higher production levels with fewer workers.

Mobility for workers between companies and industries is somewhat limited by differences in production technologies. In addition, many companies follow a policy of promotion from within whenever possible. For underground miners and oil and gas drillers, progression to positions as crew supervisors and managers is possible with experience or with a combination of experience and education.

Additional Information

For *underground miners*
Mining Association of B.C. http://www.mining.bc.ca

Mining Industry Training and Adjustment Council
http://www.mitac.ca

For *oil and gas well drillers and well servicers*
Canadian Association of Oilwell Drilling Contractors
http://www.caodc.ca

Petroleum Services Association of Canada
http://www.psac.ca

Related Occupations

- machinery and transportation equipment mechanics (731)
- driller and blasters - surface mining, quarrying and construction (7372)
- motor vehicle and transit drivers (741)
- heavy equipment operators (742)
- supervisors, mining and oil and gas (822)
- mine service workers and operators in oil and gas drilling (841)
- primary production labourers (861)
- central control and process operators in manufacturing and processing (923)

> ***The mining industry is sensitive to changes in the business cycle. Many B.C. minerals are exported, and the prices for most minerals are set in international markets. Increases in international supply of minerals by other countries who have lower extraction costs has had an adverse impact on B.C.'s mining industry. The oil and gas industry is affected by changes in the business cycle but generally less so than mining.***

Logging Machinery Operators

NOC 8241

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	2,690	2,340	2,370

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
30	220	250

Annual Growth 1998-2008 0.1%

Main Industries of Employment

Logging and Forestry	80%
Wood Manufacturing	15%
Construction	2%

Employment by Region

Lower Mainland	8%
Vancouver Island	27%
Northern B.C.	42%
Okanagan/Kootenay	23%

Self-employment 9%

Nature of the Work

People in this classification move logs from where they have been cut and organize them for transportation to the processing plant. They operate a variety of logging machinery to fall, yard and process trees at logging sites. They are employed by logging companies and contractors.

Main Duties

These work descriptions are typical for a large logging operation. Within smaller logging operations, a worker might perform several or all of these duties.

Mechanical harvester and *forwarder operators* go to logging sites with heavy equipment to perform a combination of falling, slashing, bucking, bunching, forwarding and loading operations. *Mechanical tree processors* and *operators* also use machines for these operations (except falling) at landing sites.

Rigging slingers install ground rigging for yarding lines and attach chokers to logs and then to yarding lines. *Cable yarding operators* operate machines to transport trees prepared by rigging slingers. *Chasers* direct the placements of logs at the loading area, remove chokers from logs and assist in loading logging trucks. Chasers are not logging machinery operators, but they are a part of the log loading team.

Example Titles

- butt-n-top feller operator
- cable yarding operator
- cable yarding system operator
- chaser
- feller buncher operator
- grapple yarder operator
- hoe chucker operator

- juicer
- loader operator
- mechanical harvester and forwarder operator
- rigging slinger
- steelspar operator
- treelength forwarder operator

Education and Training

Completion of grade 12 is generally required for *logging machinery operators.* On-the-job training from 3 to 16 months is usually provided depending on the complexity of machinery operated and the type of woodlands operation. Some positions require previous experience in a related field.

Mechanical harvester and *forwarder operators* may require experience as chainsaw and skidder operators. *Mechanical tree processors* and *loader operators* usually require one to three years of general logging experience. *Feller buncher operators* and *cable yarder operators* usually require three to five years of general logging experience.

Certification as an operator of heavy equipment or air brakes may be required for some positions. Loggers need to be literate and have numerical ability. Familiarity with automated and computerized machinery may be required.

Malaspina University College has a five-month program and North Island College has a four-month program in Log Scaling. Both prepare students to take the Ministry of Forests' written and practical examinations for a scaling licence. Admission requires physical suitability, grade 10 (grade 12 preferred) and proficient mathematical skills.

Northern Lights College has several silviculture-related courses. Admission requires grade 10 and the physical ability to work long hours, stooping and crouching, in all types of weather. Graduates are eligible for entry-level positions in the forestry industry and, with some experience and on-the-job training, may be able to operate some equipment.

Courses on air brakes are available at most B.C. colleges and university colleges. Malaspina University College offers a certificate program for Heavy Equipment Operators. Admission requires grade 10, a class 5 driver's licence, physical fitness and an ability to adapt to rugged working conditions.

In addition to physical strength and stamina, people in these occupations need good spatial perception abilities. They should be able to follow detailed safety procedures, have good communication skills and some analytical ability. They should be able to work outdoors in all kinds of weather and be willing to work under hazardous conditions.

Working Conditions

Workers in this occupational group spend their time outdoors and are vulnerable to all kinds of weather conditions. They should be prepared to spend their days at a noisy work site that may also be dusty or muddy. *Logging machinery operators* are exposed to vibration and very hazardous situations, such as moving logs, snapping cables and falling trees. Over long periods of time, hearing may be impaired by the high noise levels of harvesting operations if safety precautions are not taken. Avoiding injury becomes easier with experience, but there are many other preventive factors that are extremely important. Workers must use caution and proper safety measures. These include wearing hard hats, eye and hearing protection, safety clothing and boots.

The work week is normally 40 to 50 hours over a period of five days. Overtime and weekend work may be required. In smaller operations, work may be on a contract-to-contract basis. Remote work sites require travel and/or camp accommodation.

Logging machinery operators earned an average of $40,100 in 1995. About one-quarter of the workers are employed full time, full year and earned an annual average of $49,300. The respective all-occupation averages in the province in 1995 were $27,900 and $39,400. According to a recent survey of college graduates, those who found work in these occupations reported average earnings of $3,800 per month, based on 50 hours worked a week. (At this level of pay, an individual who worked full time for the whole year would earn $45,600.)

This is a medium-sized occupational group, which has seen a slight decrease (13%) in employment from 2,690 in 1990 to 2,340 in 1998. Self-employed logging machinery operators are relatively scarce at 9%. By comparison, the rate of self-employment across all occupations in B.C. is 15%. The high cost of machinery is a determining factor and often prohibits people from going into business by themselves.

This is a full-time occupation, with 95% of the workers employed on a full-time basis. However, 70% work full time for part of the year. Weather can adversely affect access to the work area, worker safety and environmental considerations at the work site, which results in seasonal variation in employment. In fact, 74% of these workers work for only part of the year. Seasonal work is defined differently in different regions of B.C. For example, coastal and Lower Mainland areas tend to have steep grades and are subjected to heavy rainfalls, and snow levels can limit access. In contrast, interior areas tend to be flatter, and harvesting is undertaken in the snow but stops for spring break-up. In the summer all regions are affected by fire hazards, which stop logging operations.

The unemployment rate for this occupational group is higher than the average for all occupations. This reflects the seasonal nature of the work and the difficult economic times that the industry has experienced in recent years.

Most logging machinery operators are employed in the logging and forestry industry (80%). There are also a significant number in wood manufacturing (15%).

The largest concentration of logging machinery operators is in Northern B.C. (42%). In terms of the balance of these workers, Vancouver Island accounts for 27%, the Okanagan/Kootenay region accounts for 23%, and the Lower Mainland accounts for 8%.

Employment numbers show that traditionally these occupations have been dominated by men. Only 1% of these workers are women. The age distribution is reasonably similar to the average for all occupations, but there are somewhat fewer workers under 25 (9%) and somewhat more workers between the ages of 35 and 44 (36%). The respective all-occupation figures are 15% under 25 and 28% between the ages of 35 and 44. The average age for logging machinery operators is 39.

Employment Prospects

This is a medium-sized occupational group, made up of about 2,340 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects very little change in employment through to 2008. According to this projection, a total of 250 positions will become available from 1998 to 2008. Only 30 of these openings are projected to come from growth in the number of new positions, and the remainder are projected to come from the need to replace workers who retire.

Employment growth in the logging and forestry industry very much determines the employment growth rate for these workers. The COPS projection for this industry calls for no growth in employment through to 2008. According to industry sources, several contributing factors will result in the need for fewer but more highly skilled workers in this industry. Among these factors are global consumer pressures for both higher quality and more environmentally responsible forest products. Reductions in the size of the allowable annual cut (AAC), along with advances and changes in technology, will reduce further the employment demand for workers in this industry. Global competition and changing product markets by Asian buyers of coastal B.C. wood also will have a negative impact on employment in this industry. Overall, all primary forestry workers, including *logging machinery operators*, are expected to experience either little change or a decline in employment from 1998 to 2008.

One source of uncertainty with the forecast for this occupational group is the renegotiation of the import restrictions that have been imposed recently by the U.S. softwood lumber agreement. The uncertain outcome of this renegotiation will have a significant employment impact for workers in the logging and forestry industry.

According to industry sources, a growing amount of logging is being done by helicopters. This is a result of land use policies and environmental concerns, which are causing logging operations to move to increasingly remote locations. A growing proportion of B.C.'s land resource is designated for parks or otherwise protected. With less available land for logging companies to chose from, they increasingly will have to settle for less accessible areas. Helicopter logging also offers an environmental alternative to traditional logging methods. It enables the selective cutting of trees and also reduces the need for logging roads, which require the loss of large quantities of trees.

Advances in technology and the need to develop new, or modify existing, machinery and equipment to accommodate new logging methods, such as helicopter logging, will continue to have major implications for *logging machinery operators*. Companies are gradually acquiring multi-function automated equipment that can do the work more efficiently with fewer workers. Due to advanced technology, workers must acquire new skills and knowledge in order to operate modern equipment and take on new responsibilities. They may perform minor repairs, diagnose technical problems and carry out basic safety inspections.

Worker mobility between coastal and interior forest zones may be limited. Tree size and different terrain conditions between these forest zones require different logging methods and the use of different machinery. There is some mobility from more complex to less complex machinery operations. *Logging machinery operators* may advance into supervisory positions with experience.

People considering entry into this and other forestry industry occupations are advised to contact the industry and employers in their region for up-to-date information before making career and training decisions.

A listing of employers can be found in the yellow pages of the telephone book under the heading of "logging companies and contractors."

Additional Information

Ministry of Forests http://www.gov.bc.ca/for

Forest Renewal B.C. http://www.forestrenewal.bc.ca

Related Occupations

- primary production labourers (861)
- silviculture and forestry workers (8422)
- chainsaw and skidder operators (8421)
- heavy equipment operators (7421)
- truck drivers (in 741 motor vehicle and transit drivers)

> ***Due to advanced technology, workers must acquire new skills and knowledge in order to operate modern equipment and take on new responsibilities.***

Contractors, Operators and Supervisors in Agriculture, Horticulture and Aquaculture

NOC 825

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	15,230	16,180	17,780

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
1,600	2,400	4,000

Annual Growth 1998-2008 0.9%

Main Industries of Employment

Agriculture	83%
Construction	7%
Amusement and Recreation Services	3%

Employment by Region

Lower Mainland	38%
Vancouver Island	15%
Northern B.C.	16%
Okanagan/Kootenay	30%

Self-employment 60%

Nature of the Work

This group is made up of workers who manage and supervise operations on a variety of farms. They are employed in crop, livestock and fish farms, landscaping companies, nurseries and greenhouses.

Main Duties

This occupational group is made up of a variety of contractors, operators and supervisors who are primarily self-employed. These workers have some common duties. They develop annual business plans and cash flow analyses, purchase supplies, operate farm equipment and supervise workers. They also manage financial records, keep inventory and establish market strategies.

Farmers and *farm managers* manage the operations and functions of a farm. They are responsible for growing crops, as well as raising and breeding livestock, poultry and other animals.

Agricultural and *related service contractors* and *managers* provide services such as livestock and poultry breeding, soil preparation, crop planting, crop spraying, cultivating or harvesting.

Specialized livestock contractors carry out feeding, health and breeding programs on dairy, beef, sheep, poultry and hog farms. They detect signs of disorders, handle and administer medication, monitor birthing and perform artificial insemination procedures.

Nursery and *greenhouse operators* and *managers* plan, implement, organize, direct and supervise the activities of nursery and greenhouse staff. They are involved in pest management, plant propagation, irrigation systems, pest identification and soil testing. They also use computers for climate and inventory control.

Landscape and *grounds maintenance contractors* and *managers* plan, organize, direct and supervise operations. They are involved in pest management, plant identification, propagation and weed control. They design landscapes and irrigation systems for private and corporate clients. They also offer bids on contracts for landscape, construction, interior plantscaping, lawncare, tree service work and grounds maintenance work.

Aquaculture operators and *managers* manage the operations of facilities that cultivate and harvest fish, shellfish or marine plants for enhancing wildlife stocks or for commercial sale.

©Stone/Vancouver

Example Titles

farmers and farm managers (8251):
- farmer
- farm manger
- farm owner/operator
- rancher

agricultural and related service contractors and managers (8252):
- agriculture contractor
- livestock contractor

farm supervisors and specialized livestock workers (8253):
- dairy production manager
- feedlot foreman/woman

nursery and greenhouse operators and managers (8254):
- Christmas tree farm operator
- flower grower
- garden centre owner
- greenhouse manager

- nursery manager
- nursery operator
- apprentice production horticulturist
- vineyard manager
- forest seedling grower

landscaping and grounds maintenance contractors and managers (8255):

- lawn maintenance contractor
- landscape service contractor
- landscaping manager
- tree service contractor

supervisors, landscape and horticulture (8256):

- cemetery foreman/woman
- greenhouse supervisor
- horticulture worker supervisor
- park caretaker

aquaculture operators and managers (8257):

- aquaculture operator
- fish hatchery manager

Education and Training

Although there are no formal educational requirements for occupations in this group, completion of a relevant diploma program plus three to five years of relevant experience are the usual prerequisites. Training in business practices is an asset. Generally, individuals should be competent and self-motivated. Computer knowledge and strong supervisory and human resource management skills are often needed. *Contractors* and *managers* providing specific services, such as artificial insemination or pesticide application, may require training certificates and licences. Special training may be required for some workers, supervisors and managers. Ongoing training is generally necessary, and some knowledge of relevant laws may also be necessary.

These workers in *agriculture* usually enjoy working outdoors and have physical stamina, patience, perseverance and excellent observational skills. They are open to new ideas and ways of doing things. An ability to incorporate new technologies is important for efficient production. These people need to be innovative and have good planning and problem-solving abilities. Mechanical expertise also is valuable.

The University College of the Fraser Valley (UCFV) offers a comprehensive two-year diploma in Agricultural Technology. All students will complete a series of core courses, plus a specialization in one of horticulture, integrated pest management or livestock production. This diploma provides students with training in modern business management, production and marketing techniques related to agricultural production. Admission requires grade 12, with English, biology and algebra 11. UCFV also offers certificates in Integrated Pest Management, Livestock Production, Milker Training and Ornamental Horticulture production.

The University of British Columbia (UBC) offers programs leading to a bachelor's degree in Agriculture. Agricultural economics, animal science, plant science and soil science are possible areas of specialization. Admission requires grade 12. Programs leading to a master's degree and a doctoral degree in Agriculture are also available at UBC.

Simon Fraser University's Centre for Pest Management offers a master's degree in Pest Management. Admission requires completion of an undergraduate degree, with courses in ecology, entomology, plant pathology and chemical pesticides.

The Agriculture Work Force Policy Board publishes an annotated inventory of all agricultural training programs and courses offered in B.C. Paper copies are available upon request, and electronic access is available through the Internet. (See Additional Information for details.)

Supervisory positions in *horticulture* usually require completion of grade 12 plus several years' experience in the occupation to be supervised. Nursery and greenhouse operators and managers, as well as landscape and grounds maintenance contractors and managers, usually complete an apprenticeship or college program in horticulture and have several years' experience as a supervisor. The landscape and production horticulture apprenticeships are both four years long and include six weeks of in-school technical training each year at the B.C. Horticulture Centre at Kwantlen University College. Courses in business management, marketing and human resource management are a strong asset. Continued upgrading normally is required.

See the profile Landscape and Horticultural Technicians and Specialists (NOC 2225) for information about horticulture education.

Completion of grade 12 and a one or two-year program in *aquaculture*, plus several years' experience in fishing or aquaculture, is usually required for employment as an aquaculture operator or manager. A university degree may be required by some employers. A commercial aquaculture or fish hatchery licence, permit or lease is required for self-employed aquaculture operators. Management training and training in fish husbandry are assets. Continual upgrading is necessary in order to remain competitive. Aquaculture technicians often are required to monitor and maintain a fish culture in isolated areas for long periods of time.

North Island College and Capilano College offer one-year certificate programs for Aquaculture Technicians. Both programs are available in distance learning format. Applicants to both programs must be at least 18 years of age or have completed grade 12.

Malaspina University College offers a two-year Fisheries and Aquaculture Technology Diploma program designed to provide a broad background in the practical and academic aspects of fish and invertebrate culture and wild stock management. Admission requires English 12, mathematics 12, chemistry 11 and an interview. Biology 12 is highly recommended. Upgrading to meet these requirements is available. Technologists may want to continue their study by entering a bachelor's degree program in Biology, with emphasis on fisheries and aquaculture.

Malaspina University College also offers a bachelor's degree in Biology as well as in Fisheries and Aquaculture. The University of Northern British Columbia offers a Fisheries major in either Biology or Natural Resource Management. As well, biology degrees are available at all B.C. universities.

UBC offers a post degree diploma in Management and Aquacultural Systems. This program is offered in conjunction with Malaspina University College. The program allows students to gain experience in aquaculture and obtain relevant job skills. Admission requires either a bachelor's degree in a relevant area or a minimum of two years' relevant post secondary education plus at least three years related work experience in aquaculture.

For all occupations in this group, mechanical skills and an ability to solve problems are important skills. Experience is highly valued, but technological change is leading to a greater emphasis on education. Self-motivation and human resource management and supervisory skills are needed. Adaptability is an asset. A willingness to upgrade one's knowledge and skills continually is a necessity.

Working Conditions

Most of these workers spend a lot of time outdoors, supervising operations and staff. At other times they do administrative work in offices. Farms may specialize in one or more areas, such as dairy, poultry, hogs, fruit, vegetables and fish. Operators, supervisors and managers on crop farms can work from sunrise to sundown during the planting and harvesting seasons.

The 1995 average annual earnings for workers in this occupational group ranged from $18,800 for *farm supervisors* and *specialized livestock workers* to $30,900 for *aquaculture operators* and *managers*. Of the seven occupations covered here, only *supervisors* in *landscape* and *horticulture* and aquaculture operators and managers earned above the provincial all-occupation average of $27,900.

As may be expected there are also significant differences in average full-time, full-year earnings for each specific type of management. *Farmers* and *farm managers* had the lowest average full-time, full-year wage at $22,800. Supervisors in landscape and horticulture had the highest earnings at $38,200 on average for a full year's work. Farm supervisors and specialized livestock workers earned an average of $24,900. *Nursery* and *greenhouse operators* and *managers* earned an average of $29,200, and *landscaping* and *grounds maintenance contractors* and *managers* earned $29,000 for full-time, full-year work. *Agricultural* and *related services contractors* and *managers* averaged $32,700 per year. Aquaculture operators and managers earned an average of $36,600 for full-time, full-year work. As a comparison, the provincial all-occupation average was $39,400 for full-time, full-year work.

According to a recent survey of college graduates who found work in these occupations, those in farm-related management occupations earned between $1,830 and $2,140 per month, based on a 42 hour week. Those in agricultural and related service management occupations earned an average of $2,570 per month, based on 48 hours per week. Those in nursery and greenhouse management occupations earned an average of $1,930 per month, based on 44 hours per week. Those working in landscaping and related management occupations earned between $2,150 to $2,300. And finally, those working in aquaculture management positions earned an average of $2,140 per month, based on 45 hours worked a week. To put an annual salary perspective on these figures, an individual who earns between $1,830 and $2,570 per month and who works for a whole year would receive between $22,000 and $30,800.

Industry sources in agriculture report that it is possible for people with extensive experience who are highly skilled to earn from $40,000 up to $70,000 annually. Note that earnings will vary depending on the type of farm, size of the farm, type of product and market prices for output.

This is a very large occupational group, dominated by farmers and farm managers who represent 72% of all workers. As for the other occupations, 8% of the workers are accounted for by landscaping and grounds maintenance contractors, 6% are farm supervisors and specialized livestock workers, 7% are nursery and greenhouse operators, 5% are supervisors in landscaping and horticulture, 2% are agricultural and related service contractors, and 2% are aquaculture operators. Overall, growth in employment has been very small (6%), from 15,230 in 1990 to 16,180 in 1998. The occupations that did experience growth were primarily farmers and farm managers and landscaping and grounds maintenance contractors.

Self-employment in general is much higher than the provincial average of 15%. The level of self-employment ranges from a high of 74% for landscaping and grounds maintenance contractors and 66% for farmers and farm managers to a low of 28% for aquaculture operators and 15% for supervisors in landscaping and horticulture.

A large proportion of those in these occupations work full time (78%), with approximately 55% employed full time for the whole year, despite the tendency toward seasonal work in the agriculture industry. This is because management duties and operations take place year round on all farms. In aquaculture, industry sources report there is a trend toward full-time, full-year work because new species being introduced are not as seasonal (for example, geoduck clams). Some workers do have part-time work (22%), but this rate of part-time work is below the provincial average of 26%.

With the exception of farm supervisors and specialized livestock workers, the unemployment rate for this occupational group is lower than the average for all occupations. It is higher than average for farm supervisors and specialized livestock workers. The relatively low rate of unemployment reflects the high level of self-employment among these workers as well as their transferable business skills.

About 83% of the workers in this group are employed in agriculture. This includes those working on farms with livestock, in field crops, on fruit and vegetable farms and in nurseries. Those industries that employ much smaller proportions of workers than agriculture are construction at 7% (including landscaping companies) and fishing at 2% (including fish farms).

Workers in this group are located in the Lower Mainland (38%), the Okanagan/Kootenay region (30%), Northern B.C. (16%) and on Vancouver Island (15%). Most work related to agriculture and horticulture is located in the Lower Mainland and the Okanagan/Kootenay regions. Aquaculture is mainly located along the coast of mainland B.C. and the east coast of Vancouver Island.

Overall, one in three of these management positions is held by women. This is a good representation, but lower than the average of 46% for all occupations in the province. Farm supervisors and specialized livestock workers, and nursery and greenhouse operators have the highest proportion of women workers, at 44% and 41% respectively. At the other end of the scale, only 17% of landscaping and grounds maintenance contractors and 19% of aquaculture operators are women.

Overall, more than half (56%) of these workers are 45 years or older, which compares to only 32% for the workforce as a whole. Among farmers and farm managers, the largest occupation in the group, the average age is 51. This is much higher than the workforce average age of 38 and may, in part, reflect the cost of entry into this occupational group and the work experience that is required. For example, purchasing or leasing land and equipment requires a large amount of capital. The above average age for farmers also reflects the scarcity of young people entering the industry over the past 10 years. In contrast, the average age for landscaping and grounds maintenance contractors and for supervisors in landscaping and horticulture is 38. Overall, these workers have a large proportion (16%) of people aged 65 and over who are still working. This compares with only 2% for the workforce as a whole.

Employment Prospects

This is a very large occupational group in B.C., made up of 16,180 workers in 1998. The Canadian Occupational Projection System (COPS) projects employment in this group to grow at an annual rate of 0.9%, slower than the average for all occupations. As it is such a large occupational group, even this slow growth rate will result in 4,000 openings becoming available in this field from 1998 to 2008. About 60% of these openings are projected to come from the need to replace workers who retire, and the remainder will come from growth in the number of new positions.

Over 80% of the workers in this occupational group are employed in the agricultural industry. Growth in this industry very much determines the rate of employment growth for these workers. Employment in the agricultural industry is expected to grow at a rate that is well below the all-industry average through to the year 2008. There are many factors responsible for this slow rate of growth. These include global competition, trade agreements, new technology, a limited additional land base available for agriculture and concerns about the environment. Technological changes in machinery, production and harvesting are creating demands for fewer but more knowledgeable and highly trained workers.

Employment growth in some occupations in this group is determined by other factors or industries. Consequently employment prospects for these occupations vary considerably. One source of employment growth for these workers overall is the growing demand for specialty horticultural products. Another area of expected growth is landscaping and ground maintenance, where expanding demand is related to an aging population requiring additional services.

It is estimated that about 72% of the workers in this group are *farmers* and *farm managers*. Employment growth is particularly slow for these workers because almost all of them are employed in the agricultural industry. Consequently only around 50% of the projected openings for this occupational group (2,030 in total) are for positions in this field.

A total of only 240 openings are projected for *agricultural* and *related service contractors* and *managers*. Because there are so few of these workers, projections can be made with only limited accuracy. Employment prospects of these workers are determined by employment growth in the agricultural industry.

Projections call for no growth in employment of *farm supervisors* and *specialized livestock workers*. However, 140 openings in this field are projected to result from the need to replace workers who retire. Employment prospects of these workers are also linked to that of the agricultural industry.

Average employment growth is projected for *nursery* and *greenhouse operators* and *managers*. A total of 300 openings are projected for these workers. Although most are employed in the agricultural industry, there is a growing demand for their products because of a growing interest in gardening and landscaping by an aging population. These products include trees, shrubs, flowers and other plants. Nurseries raising seedlings for silviculture will require more highly trained management to deal with changes to sophisticated systems and with maintenance. Greenhouse operations are also expected to grow due to increasing Canadian and U.S. markets for B.C. grown greenhouse vegetables.

Employment of *landscaping* and *grounds maintenance contractors* and *managers* is projected to grow much faster than the average for all occupations. According to projections, a total of 890 openings will become available for positions in this field. Most of these openings are for new positions resulting from growth in the construction industry. Additional openings will be in other business services industries.

Faster than average employment growth is projected for *supervisors* in *landscape* and *horticulture*. About 310 openings are projected for these workers. Most of these openings are also expected to result from growth and retirements in the construction industry. Industry sources indicate that there is a shortage of people who are qualified for management positions in this field.

Employment of *aquaculture operators* and *managers* is projected to grow at an average rate. Projections call for only 110 openings in this field over the projection period. B.C. is already the fourth largest farmed salmon producer in the world, and a growing proportion of B.C.'s salmon sales are from farmed salmon. Employment in the shellfish industry is also expected to experience considerable growth over the next ten years due to changes in government policy. The B.C. Assets and Land Corporation has recently approved 66 applications from shellfish farmers to expand their operations. Many employment opportunities are expected to result from this. There are still major constraints on this industry, however. They include adaptation of technologies to the B.C. situation, development of new markets, potential fish stock diseases and environmental concerns.

Additional Information

Ministry of Agriculture, Food and Fisheries
http://www.gov.bc.ca/agf

Agricultural Workforce Policy Board (AWPB)
http://www.island.net/~awpb

A detailed inventory of training programs and courses for agricultural training (including horticulture) in B.C. is available from the Agriculture Work Force Policy Board. Copies are available by writing the Board at 2795 Grafton Avenue, Qualicum Beach, B.C., V9K 1W8 or call (250) 752-1564.

Agricultural Labour Pool http://www.agri-labourpool.com

Industry Training and Apprenticeship Commission
http://www.itac.gov.bc.ca

Related Occupations

agriculture:
- primary production labourers (861)
- general farm workers (8431)
- pet groomers and animal care workers (648)

horticulture:
- nursery and greenhouse workers (8432)
- contractors and supervisors, trades (721)

landscaping and grounds maintenance:
- landscape architects (in 215 architects)
- landscape and horticulture technicians (2225)

aquaculture:
- labourers in primary industry (861)
- aquaculture diver (in 7382 commercial divers)
- aquaculture technician (in 2221 biological technologists and technicians)

> ***Technological change is leading to a greater emphasis on education.***

Fishing Vessel Masters and Skippers and Fishermen/women

NOC 826

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	3,850	2,230	2,360

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
130	150	280

Annual Growth 1998-2008 0.6%

Main Industries of Employment	
Fishing and Trapping	93%
Wholesale Trade	3%
Fish Products Manufacturing	2%

Employment by Region	
Lower Mainland	37%
Vancouver Island	46%
Northern B.C.	16%
Okanagan/Kootenay	1%

Self-employment 56%

Nature of the Work

Fishing vessel masters, skippers and *fishermen/women* manage and operate ships and boats to catch fish and other marine life. Most are self-employed or are owner-operators of their vessels. Workers may also be employed by commercial fishing companies or by owner-operators of fishing vessels.

Main Duties

Fishing masters and *officers* command vessels greater than 100 gross tonnes. They determine fishing courses and compute navigational positions using compasses, charts, tables and other aids. They steer vessels and operate electronic fishing instruments. They supervise crew activities, record fishing progress and monitor working conditions.

Fishing vessel skippers and *fishermen/women (fishers)* estimate costs of operations and plan budgets for each fishing season. They establish fish marketing plans and keep records of all financial transactions. They operate fishing gear, supervise fishing crew members such as deckhands, steer vessels and operate navigational instruments and electronic aids. They also record fishing progress, crew activities and sea conditions in ship's logs.

Example Titles

fishing masters and officers (8261):
- captain, fishing vessel
- deck officer, fishing vessel
- trawler captain

fishing vessel skippers and fishermen/women (8262):
- fisher

- fisherman/woman

Education and Training

Usually *fishing vessel workers* require grade 12, plus one to two years of experience as a fishing vessel deckhand. Owners and operators of fishing vessels may require a Fishing Master III ticket (or higher), depending on the size of the vessel. On some vessels, skippers and first mates may also require a Fishing Master III ticket.

All *operators/skippers* require a commercial fishing licence and knowledge and skills about the "rules of the road," navigation, boat handling and stability, weather-watch, radio telephone techniques, use of electronic gear, financial procedures, and use and care of equipment and gear. In addition, decision making during life-threatening situations at sea, effective ways of orienting, training and supervising crew and techniques of ensuring quality fish handling are important skills. All fishing vessels must be licensed, and safety inspections are encouraged.

The Pacific Marine Training Campus (PMTC) of the British Columbia Institute of Technology offers Nautical Training programs designed for people in the marine industry who want to prepare for various Transport Canada certification examinations. The PMTC offers courses leading to certification as a Fishing Master, Classes IV through I, as well as courses in preparation for fishers certificates and a course in Engineering Knowledge for Fishers. Various courses in safety and seaworthiness are also available.

Northwest Community College also offers courses leading to certification as a Fishing Master, Classes IV through II.

North Island College provides preparation for Fishing Master Class III and IV, as well as courses in Marine Emergency Duties, Small Craft Master and Watchkeeping Mate.

Students should be aware that Transport Canada has both sight and sea time requirements for persons intending to write their exams. They recommend that students first obtain approval from the Ship Safety Department of the Canadian Coast Guard before applying to the study programs.

Fishing vessel workers need good communication and analytical skills and should have an interest in working with details, processes, machines and techniques. Good health is important. Exposure to extreme weather conditions and varying climates is required. Long periods of travel are also part of this work. Patience, alertness, awareness of safety issues and an ability to follow exact instructions are important. Knowledge of boat motors and how to make electrical repairs is an asset.

Working Conditions

Workers in this occupational group work long hours and perform physical tasks on vessels. Workers should be prepared to be exposed to various kinds of hazardous conditions, such as storms, freezing rain, fog, wind, rocky waters and malfunctioning communications equipment.

Fishing is often done in very isolated areas. Workers should be aware that medical treatment for serious injuries may have to wait until they can be transferred to hospital. They should also be aware that fishing trips often require being out to sea for extended periods of time, hundreds of miles away from the home port.

The average earnings for *fishing masters* and *officers* were $36,500 in 1995. This is above the provincial all-occupation average of $27,900. Those working as *fishing vessel skippers* and *fishermen/women* earned an average of $21,200 in 1995. Due to the seasonal nature of the fishing industry, about 68% of the workers in both of these occupations were employed full time for part of the year. According to a recent survey of college graduates who found work in these occupations, fishing masters reported earning an average of $4,140 per month, based on 47 hours worked a week. Those who found work as fishing vessel skippers and as fishermen/women reported earning an average of $3,510 per month, based on 50 hours worked a week.

There are also differences in the full-time, full-year salary for each specific occupation in this group. About 16% of the fishing masters and officers worked full time for the whole year, and they earned an average of $48,100 in 1995. About 12% of fishing vessel skippers and fishermen/women worked full time for the whole year, and they earned an average of $30,600. The level of earnings depends upon many factors. These include the type of boat and equipment used, the species of fish sought, the allotted quota and the market price of the catch.

There has been an overall decrease (42%) in the number of workers employed in this medium-sized occupational group. The numbers fell from 3,850 in 1990 to 2,230 in 1998. Fishing vessel skippers and fishermen/women make up 90% of this total number, and fishing masters and officers make up the remaining 10%.

Self-employment (56%) is very much above the 15% provincial all-occupation average. A majority of these self-employed workers are the skippers and fishermen/women who own and operate their boats.

Part-time work (20%) is below the provincial all-occupation average (26%) as most workers are employed full time (81%). However, most of the people in this occupational group (86%) work seasonally. Many work part of the year, particularly in the summer when demand for these workers peaks. Some workers also supplement their income by working other jobs during the off-season. Such activities may include sightseeing boat charters and waterway habitat restoration.

The unemployment rate for this group is higher than the average for all occupations. This reflects the seasonal nature of the work as well as the downturn in the industry. In this occupational group, seasonal work is caused by weather conditions, the fish spawning cycle and regulated fishing seasons.

As may be expected, workers in this group are mainly employed in the fishing industry (93%). There are a small number employed by firms in the fish products processing industry (2%).

While this group may work anywhere up or down the coast, most of these workers live on Vancouver Island (46%). The rest of the workers are located in the Lower Mainland (37%), in Northern B.C. (16%), and a few (1%) live in the Okanagan/Kootenay region. Although some workers choose to live in urban areas or in communities away from the ocean, they travel to the coast to join their crew and go fishing for extended periods.

There are fewer women in this occupational group (10%) than average for all occupations (46%). These workers tend to be older than average. Those aged 45 and above represent 44% of the workers, compared to only 32% of the workforce as a whole. The average age is 43, five years older than the all-occupation average age (38). The higher average age may reflect the high cost of entry into this occupational group for those who have purchased their own boat. The downturn in the industry may also mean that fewer young people are entering the fishing industry, which will tend to increase the average worker age.

©Stone/Vancouver

Employment Prospects

This is a medium-sized occupational group, made up of about 2,230 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment in this group to grow at an annual rate of 0.6%, slower than the average for all occupations. According to this projection, 280 positions will become available from 1998 to 2008. A little over half of these will be the result of retirements and the remainder are projected to come from growth in the number of new positions. It should be noted that B.C.'s fishing industry saw a major restructuring and that there was a notable decrease in employment in this occupational group during the 1990s. Employment levels by the year 2008 are projected to be only 60% of levels seen in 1990.

Both occupations in this group are projected to grow at about the same rate, slower than the average for all occupations. However, because about 90% of the workers in this group are *fishing vessel skippers* and *fishermen/women*, about 90% of the projected openings for this occupational group (a total of 250) are for positions in that field. A total of only 30 openings are projected for *fishing masters* and *officers*.

Almost all the workers in both these occupations are employed in the commercial fishing industry. Consequently employment conditions are very much reflected in the employment growth of these workers. No growth in employment is projected for this industry. Advances in technology, the availability of fish and the laws governing fish stocks determine the employment conditions in this industry. Conservation concerns have led to strict regulations on the commercial fishing of sockeye, coho and chinook salmon. As a result, the 1998 wild salmon harvest was the lowest in 50 years. Although fish stocks are expected to recover somewhat over the long term, resulting employment benefits are not expected to be felt over the next ten years. To meet specific domestic and global market demands in the meantime, the B.C. seafood product base is expected to diversify to use other fish.

Groups outside the commercial fishing sector are demanding a greater share of the available wild resources. With growth in tourism and sport fishing, the sport fishing market is pressing to keep their share of the catch. In addition, aboriginal land claims and treaty negotiations will have an impact on the distribution of the available fish supply, as well as on who will be employed in the industry.

Technological changes are also increasing the skill requirements of fishing vessel operators. Vessels are gradually being equipped with electronic navigational and tracking devices. This includes such equipment as depth sounders, fish finders and equipment to interpret weather and vessel conditions. Due to these advances, workers must acquire additional skills and knowledge in order to take on new responsibilities, as well as to operate modern equipment. They need to be able to interpret weather and vessel conditions, perform minor repairs, diagnose technical problems and carry out safety procedures.

Although fishing vessel masters and operators face very uncertain seasons and earnings from fishing, some may be able to create additional work by operating sightseeing boat charters and helping in waterway and habitat restoration projects.

People considering entry into fishing industry occupations should be aware of the major challenges facing the industry. They are advised to contact directly those working in the industry, including vessel skippers, masters and fishermen/women, for current information.

Employers can be found by visiting fishing docks and by looking in the yellow pages under fishing companies.

Additional Information

B.C. Council of Professional Fish Harvesters
http://www.northisland.net/bccpfh

Ministry of Agriculture, Food and Fisheries
http://www.gov.bc.ca/agf

Fisheries Renewal B.C. *http://www.fishrenewal.gov.bc.ca*

BCIT Fish Harvesting and Processing Technology Program
http://www.fishtech.bcit.bc.ca

Related Occupations

- transportation officers and controllers (227)
- fishing vessel deckhands (8441)

Skill Level C - Intermediate Occupations

Mine Service Workers and Operators in Oil and Gas Drilling

NOC 841

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	530	560	610

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
50	20	70

Annual Growth 1998-2008 0.9%

Main Industries of Employment

Services Incidental to Mining	46%
Metal Mining	30%
Crude Petroleum and Natural Gas	12%

Employment by Region

Lower Mainland	5%
Vancouver Island	8%
Northern B.C.	47%
Okanagan/Kootenay	41%

Self-employment 6%

Nature of the Work

Underground mine service and *support workers* and *oil* and *gas well drilling workers* are in this group. These workers construct work sites and extract and transport oil and minerals. They use a variety of equipment and machinery to carry out these duties.

Underground mine service and support workers are employed by coal, metal and non-metallic mineral mines. Oil and gas drilling operators are employed by drilling and well service contractors and petroleum-producing companies. Even though this occupational group includes a range of occupations, it is very small.

Main Duties

Underground mine service and *support workers* perform a range of duties related to the operation of ore passes, chutes and conveyor systems. They are responsible for the construction and support of underground structures, passages and roadways. They assist miners in setting up and operating equipment and machinery. They also operate track haulage equipment to distribute personnel and supplies and perform routine maintenance of machinery.

Oil and *gas well drilling workers* operate drilling and service rig machinery as intermediate members of the rig crew. They align and manipulate sections of pipe or drill stem from the rig during the removal and replacement of pumps and drills. They operate drilling mud systems, record mud flows and take samples. They operate and maintain drilling rig diesel motors, transmissions and other mechanical equipment. They also assist in setting up, taking down and transporting drilling and service rigs.

Oil and *gas well service operators* drive trucks and operate specialized hydraulic pumping systems to place cement in wells and to treat wells with chemicals, sand mixtures and gases to stimulate production. They read gauges to interpret conditions and control the pumping process. They may also mix chemicals and cements.

Example Titles

underground mine service and support workers (8411):

- backfiller
- cage tender
- conveyor operator
- crusher operator
- haulageman/woman
- lamp keeper
- materialman/woman
- mine construction worker
- nipper
- orepass tender
- pipe worker
- raise miner helper
- skip tender
- timberman/woman
- trainman/woman

oil and gas well drilling workers and services operators (8412):

- acid truck driver
- blender operator
- cementer
- chemical services operator
- coiled tubing operator
- derrickman/woman
- formation fracturing operator
- motorman/woman
- nitrogen operator
- pumper operator
- pumpman/woman

Education and Training

Grade 10 is usually required, although grade 12 may be preferred or required, for occupations in this group.

In the mining industry, some formal training followed by on-the-job training as a helper or support worker is also required. Previous experience as a labourer is often a prerequisite.

Training with an experienced operator is required for *oil* and *gas well service operators*. Experience as a floor hand, assistant or labourer and certification in various safety procedures may be required.

Northern Lights College offers a Power Engineering and Gas Processing Certificate program that provides the entry-level training necessary to work in the oil and gas industry. Graduates' credentials must include a fourth class and part A of third class Power Engineering, all four levels of Gas Processing Technology (jointly certified by the Southern Alberta Institute of Technology) plus a number of safety and environmental certificates. They are then able to progress to higher levels of certification, such as first and second class power engineering. Applicants to the program must be at least 18 years of age (grade 12 is recommended) and must successfully complete a college entrance examination and attend an interview.

The British Columbia Institute of Technology offers two-year diploma programs in Mining and Petroleum and Natural Gas. Graduates work as technologists in either industry. Admission requires grade 12.

For these occupations, prospective workers should enjoy working outdoors and have good coordination, agility and physical strength. An ability to follow precise instructions, obey safety regulations and work as a member of a team is essential.

Working Conditions

Underground mine service and *support workers* work under a variety of conditions. Some of their time is spent underground, building passages and roadways where it can be dark and damp. The rest of their time is spent above ground operating heavy equipment where they are exposed to all types of weather.

Oil and *gas well driller operators* spend most of their day performing physical duties outdoors and are also subject to all kinds of weather.

Working conditions are sometimes difficult and hazardous, whether underground or not. All B.C. mines and drilling sites follow strict safety procedures, and workers must wear gloves, eye protection, hard hats and steel-toed boots.

Rotating shift work is frequent. A shift may vary from 8 to 12 hours, depending on the worker's position and the location of the work. Overtime and weekend work, primarily in the early mornings or evenings, may be required. Workers often belong to unions where seniority may be important in obtaining shifts. In the case of smaller operators, work may be on a contract-to-contract basis, and layoffs may occur in between.

The average annual earnings for underground mine service and support workers in 1995 were $49,200. Oil and gas well drilling workers and services operators earned an average of $33,500 per year. These are higher than the comparable all-occupation average earnings of $27,900. About 61% of the underground mine service workers were employed full time, full year, and they earned an average of $51,900. The oil and gas well drilling workers who were employed full time, full year (39%) earned an average of $45,900. Again, these earnings levels are higher than the comparable all-occupation average of $39,400.

With a total of about 560 employed workers in 1998, these are two very small occupations. Overall, there has been little change in the number of employed workers from 1990 to 1998. There has been a minor increase in the number of oil and gas well drilling workers from 260 in 1990 to 300 in 1998, but there was a similar decrease in the number of underground mine service workers. The oil and gas well drilling workers make up 54% of the total workers in this occupational group. Self-employment is low at 3% for underground mine service workers, and it is 9% for oil and gas well drilling workers. This compares with an average of 15% for all occupations.

Part-time work (2%) is almost non-existent in this group, as almost everyone works on a full-time basis. The statistics indicate that 37% of the underground miner service workers and 58% of the oil and gas well drilling workers work full time for part of the year. The unemployment rate for underground mine service workers is below the average for all occupations, but it is higher than the provincial average for oil and gas well drilling workers. The relatively high level of employment for the oil and gas well drilling workers probably reflects the seasonal nature of their work.

Underground mine service and support workers are employed in metal mining (66%), coal mining (17%) and mining service industries (15%). Oil and gas well drilling workers and services operators are employed in mining service industries (73%) and in mining for petroleum and natural gas (23%).

These jobs are located where the resources are. Therefore, most of the underground mine service workers (61%) are located in the Okanagan/Kootenay region, with 18% in Northern B.C. and a further 16% on Vancouver Island. The oil and gas well drilling workers are concentrated in Northern B.C. (73%), with an additional 16% in the Okanagan/Kootenay region.

This occupational group is dominated by men. Only 2% of these workers are women. The age distribution of these two occupations are somewhat different. There are no underground mine service workers under 25, and 45% are between 35 and 44. By comparison, 15% of the B.C. workforce are under 25, and only 28% are between 35 and 44. The result is that the average age for the underground mine service workers is 41, three years older than the provincial workforce average. This suggests that these positions do not involve entry-level jobs. In contrast, 21% of the oil and gas well drilling workers are under 25, and a further 34% are between 25 and 34 (so 55% are under 35). By comparison, only 40% of the B.C. workforce is under 35. The average age for oil and gas well drilling workers is 33, five years younger than the provincial workforce average.

Employment Prospects

This is a very small occupational group, made up of only about 560 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment in this group to grow at an annual rate of 0.9%, slower than the average for all occupations. According to this projection, only 70 positions will become available from 1998 to 2008. Fifty of these openings are projected to come from growth in the number of new positions, and the remaining twenty will result from the replacement of retired workers.

Almost half of the workers in this occupational group are *underground mine service* and *support workers*. Employment of these workers is projected to decline resulting in a net loss of jobs. All of the projected openings for this occupational group are for *oil* and *gas well drilling workers* and *services operators*. Employment of these workers is projected to grow faster than the average for all occupations.

Employment growth for oil and gas well drilling workers and services operators is linked to the expected high employment growth in the oil and gas industry. Industry officials expect that the planned $25 billion of investment over the next ten years will result in a doubling of gas and oil production. According to industry analysts, an average of 400 oil and gas wells were drilled annually in B.C. over the past decade. They estimate that as many as 700 wells will be drilled in the year 2000 and that this is the beginning of an upward trend. The provincial government has also recently announced a series of royalty and regulatory initiatives to assist the goal of doubling natural gas production and increasing investment in B.C.'s oil and gas industry.

B.C. also has vast reserves of oil and gas off its northern coast that have been off limits for oil and gas companies for almost 30 years because of federal and provincial bans on offshore drilling. There is growing pressure from coastal and northern communities to lift this moratorium on offshore exploration. Such a policy change could result in significant additional employment growth for oil and gas well drilling workers and services operators.

There are several factors responsible for the decline in employment projected for underground mine service and support workers. Employment in mining decreased during the 1990s with the closure of 14 mines. According to industry sources, exploration spending fell by more than 50% from 1997 to 1998 and is now at a level that is insufficient to maintain the current level of mining activity. However, mining exploration activity has been rising to date during the first half of the year 2000. Another negative factor for mining employment prospects is that the amount of land available for mining is declining because of increasing environmental concerns, and potentially costly environmental challenges in some cases can be a factor in not pursuing potentially viable mining operations. Environmental concerns have also resulted in a growing proportion of B.C.'s land resource being designated for parks or otherwise protected.

Technological advancements have led to higher production levels with fewer workers. These improvements have also led to a demand for more highly skilled workers. Employment for this lesser skilled occupation of underground mine service and support workers is expected to fall, while the related but more highly skilled underground production and development miners (see profile 823) are expected to see modest but positive job growth. Workers will not only be required to operate equipment, but will also be required to perform repairs and take decisive action when conditions warrant.

The mining industry is very sensitive to changes in the business cycle. World mineral prices can and do change quickly, which can lead to increased or decreased demand for employees in the course of a year. The oil and gas industry is also affected by changes in the business cycle but generally less so than mining. However, seasonality plays an important part in the natural gas industry, with many employment opportunities occurring in the winter when the ground is frozen.

Most workers in this occupational group do not hold entry-level jobs. They start as general labourers and then advance after they have gained practical on-the-job training. Demand for multi-skilled workers is increasing in this industry.

Mobility for workers between companies is possible but is somewhat limited because of the differences in production technologies between sectors. An additional factor is that many companies follow a policy of promotion from within whenever possible.

Additional Information

For *underground mine service and support workers*
Mining Association of B.C. http://www.mining.bc.ca

Mining Industry Training and Adjustment Council
http://www.mitac.ca

For *oil and gas well drilling workers and services operators*
Canadian Association of Oilwell Drilling Contractors
http://www.caodc.ca

Petroleum Services Association of Canada
http://www.psac.ca

Related Occupations

- machinery and transportation equipment mechanics (731)
- drillers and blasters - surface mining, quarrying and construction (7372)
- motor vehicle and transit drivers (741)
- heavy equipment operators (742)
- supervisors, mining and oil and gas (822)
- underground miner, oil and gas drillers and related workers (823)
- primary production labourers (861)
- central control and process operators in manufacturing and processing (923)

Chainsaw and Skidder Operators

NOC 8421

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	3,780	3,100	2,550

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
-550	720	170

Annual Growth 1998-2008

-1.9%

Main Industries of Employment

Logging and Forestry	86%
Wood Manufacturing	8%
Agriculture	2%

Employment by Region

Lower Mainland	9%
Vancouver Island	26%
Northern B.C.	35%
Okanagan/Kootenay	30%

Self-employment

16%

Nature of the Work

Chainsaw operators may be called fallers or buckers. They operate chainsaws to fall, delimb and buck trees (cut trees into logs). *Skidder operators* operate crawler tractors to move or yard felled trees from the logging site to the landing area for transportation. Both types of workers are employed by logging companies and contractors.

Main Duties

Fallers and *buckers (chainsaw operators)* clear undergrowth and prepare wooded areas for logging operations by adhering strictly to boundaries laid out by forest engineers. They use chainsaws to fall, delimb and buck trees. That is, after cutting down trees, they remove limbs and cut trees into specific lengths for transportation. Chainsaw operators must be able to keep chainsaws in good working order.
Self-employed chainsaw operators must have their own equipment, while workers employed by larger companies are supplied with equipment.

Skidder operators are mostly employed in the interior regions of B.C. They drive crawler tractors to move or yard felled trees from logging sites to landing areas for processing and transportation. At the landing area, log handling equipment operators use tracked equipment to load or unload logs and pulpwood on or off trucks.

In the interior of the province, work is often carried out by teams of two, consisting of a faller and a skidder operator. Cable yarding systems are used in place of skidders at steeper coastal logging operations.

©Stone/Vancouver

Example Titles

- bucker
- chainsaw operator
- faller
- forest worker
- landing person
- skidder operator

Education and Training

Completion of grade 12 and formal training in chainsaw operation and maintenance is usually required for *fallers* and *buckers*. Several months of on-the-job training are generally provided, including a two-week Workers' Compensation Board course. Prerequisite experience varies depending on the type and location of operation, but generally workers must know tree species and grades of lumber and be able to look at a tree and decide the grade and direction in which it will fall. For related information on work as a sawyer, see the profile Lumber Processing and Pulp and Paper Processing (NOC 943).

There are no formal educational requirements for *skidder operators*, but a Heavy Equipment Operator program offered at Malaspina University College is recommended. The Operators Training School in Langley B.C. is a private post secondary institution that also offers various heavy equipment training. All courses place emphasis on skill development by actual equipment operation on a simulated job site. These courses are competency based and job oriented. Most companies, however, provide on-the-job training under the supervision of an experienced worker.

Workers in this group need to be able to read maps, interpret mapped out sections (called prescriptions) and follow precise instructions. An attention to safety regulations is vital, and an Industrial First Aid certificate is highly recommended.

Working Conditions

Workers in this occupational group must be physically fit in order to perform strenuous duties outdoors in all weather conditions. Workers should be prepared to spend their days at a noisy work site, which may also be dusty or muddy. They are exposed to hazards, such as heavy logging machinery in confined areas, falling trees or logs and snapping cables.

Over a long period of time, hearing may be impaired by high noise levels from saw and skidding operations if safety precautions are not taken. Avoiding injury becomes easier with experience, but there are many other preventive factors that are extremely important. Workers must use caution and proper safety measures. These include wearing hard hats, eye and hearing protection, safety clothing and boots.

A work week is normally 40 to 50 hours over a period of five days. There may be morning or evening shifts as well as overtime and weekend work. In the case of smaller operators, work may be on a contract-to-contract basis with layoffs occurring in between. Work sites may also be remote and require travel and/or camp accommodations. Workers travel by airplanes, helicopters or four-wheel-drive vehicles to get into some isolated areas.

Workers in this occupational group earned an estimated annual average of $34,100 in 1995, which is higher than the provincial all-occupation average of $27,900. Full-time, full-year workers earned an average of $48,400. This is higher than the provincial earnings average of $39,400. Most fallers and buckers are paid an hourly or daily rate. Some are paid by the volume of timber they fall per day.

There has been a decrease in employment levels in this medium-sized occupational group from 3,780 in 1990 to 3,100 in 1998. Self-employment of chainsaw and skidder operators (16%) is slightly above the 15% provincial average in B.C.

There is a very low proportion of part-time workers (10%) in this occupational group. This is below the all-occupation average of 26% for part-time workers. The majority of workers in this occupation are employed full time for part of the year (83%).

The unemployment rate for this occupational group is high, due to the seasonal nature of employment and the high level of contract work. Over the year, employer demand for workers is largely affected by seasonal weather fluctuations, fire seasons and terrain composition. There are muddy spring months, dry summer-fire months and cold snow-covered winter months.

Chainsaw and skidder operators are mainly employed in the logging and forestry sector (86%), and a small number (8%) are employed in the wood manufacturing industry. This sector consists of logging, forestry and wood products manufacturing industries.

Most workers are employed in rural areas of Northern B.C. (35%), the Okanagan/Kootenay region (30%) and Vancouver Island (26%). These are not urban jobs, and few workers are employed in Vancouver and Victoria, where a large proportion of B.C.'s population resides.

Men have traditionally dominated this occupation. There is a very small representation of women (2%). Only about 14% of the workers are under the age of 25, which is slightly above the provincial all-occupation average of 15%. This small proportion in the younger age group suggests that these are generally not entry-level positions.

Employment Prospects

This is a medium-sized occupational group, made up of about 3,100 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment in this occupational group to decline by 550 workers to 2,550 by the year 2008. Only 170 job openings are projected to result from the need to replace workers who retire.

Employment growth in the logging and forestry industry very much determines the employment growth rate for *chainsaw* and *skidder operators*. The COPS projection for this industry calls for no growth in employment through to 2008. According to industry sources, several contributing factors will result in the need for fewer but more highly skilled workers in this industry. Among these factors are global consumer pressures for higher quality and more environmentally responsible forest products. Reductions in the size of the allowable annual cut (AAC), along with advances and changes in technology, will further reduce the employment demand for workers in this industry. Global competition and changing product markets by Asian buyers of coastal B.C. wood will also have a negative impact on employment in this industry. Overall, all primary forestry workers, including *chainsaw* and *skidder operators*, are expected to experience either little change or a decline in employment from 1998 to 2008.

One source of uncertainty with the forecast for this occupational group is the impending renegotiation of the import restrictions that have been imposed recently by the U.S. softwood lumber agreement. The uncertain outcome of this will have a significant employment impact for workers in the logging and forestry industry.

According to industry sources, a growing amount of logging is being done by helicopters. This is a result of land use policies and environmental concerns, which both result in logging operations moving to increasingly remote and less accessible locations. Helicopter logging offers an environmental alternative to traditional logging methods. It enables the selective cutting of trees and also reduces the need for logging roads, which require the loss of large quantities of trees.

Advances in technology and the need to develop new, or modify existing, machinery and equipment to accommodate new logging methods, such as helicopter logging, will continue to have major implications for *chainsaw* and *skidder operators*. Companies are gradually acquiring multi-function automated equipment that can do the work more efficiently with fewer workers. Due to advanced technology, workers must acquire new skills and knowledge in order to operate modern equipment and take on new responsibilities. They may perform minor repairs, diagnose technical problems and carry out basic safety inspections. This ability to perform a variety of tasks is also important to help these seasonal forestry workers make up full-year employment.

Global consumer pressures against clear cutting and eco-certification are changing logging practices. B.C. forest companies are striving to eco-certify their wood and paper products in order to sell their products to environmentally sensitive consumers. For example, Weyerhaeuser Canada, a B.C. forestry company, has responded to consumer environmental pressures by eco-certifying all of their forestry products. This company now conducts its logging by selectively cutting trees, as opposed to traditional clear cutting practices. This eco-certification assures this company access to the environmentally sensitive Dutch homebuilding industry. The Provincial Forest Practices Code also contains specific requirements and regulations for harvesting methods and transportation operations. For example, *skidders* are not to be used on certain terrain in the interior of B.C. due to the fragility of sensitive ground at different times of the year.

Employment mobility may be limited between coastal and interior forest zones. This is principally because tree size and different terrain conditions require different logging methods. Organizational differences contribute to the lack of mobility. For example, on the coast workers are generally paid employees of major unionized companies, while in the interior the logging is primarily contracted out to small, non-union businesses. There is also little mobility between the occupations of *chainsaw operators* and *skidder operators*, despite the fact that they often work in teams.

People considering entry into these and other forest industry occupations are advised to contact the industry and employers in their region for up-to-date information before making career and training decisions.

Additional Information

Ministry of Forests http://www.gov.bc.ca/for

Forest Renewal B.C. http://www.forestrenewal.bc.ca

Related Occupations

- primary production labourers (861)
- silviculture and forestry workers (8422)
- logging machinery operators (8241)

Silviculture and Forestry Workers

NOC 8422

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	2,680	6,180	7,130

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
950	1,720	2,670

Annual Growth 1998-2008	1.4%
Main Industries of Employment	
Professional Business Services	67%
Logging and Forestry	24%
Provincial and Territorial Administration	6%
Employment by Region	
Lower Mainland	10%
Vancouver Island	17%
Northern B.C.	39%
Okanagan/Kootenay	34%
Self-employment	6%

Nature of the Work

Silviculture and *forestry workers* work in reforestation and in the management, improvement and conservation of forests. They are employed by logging companies, contractors and government services.

Main Duties

Silviculture workers assess the planting site, select seedlings and plant trees using manual tools. They thin and clear trees and vegetation in reforestation areas. They use manual tools and chemicals for controlling weeds and undergrowth in regenerating forest stands. They also collect seed cones and prune trees.

Forestry workers operate bulldozers or other equipment to pull a variety of site preparation equipment over areas being prepared for tree planting. This work is often done by logging machinery operators during clean up.

Forest fire fighters suppress fires by handling water pumps, felling trees, digging trenches and extinguishing flames. They are often supervised by a fire suppression officer or a forestry technician at the fire site. When they are not fighting fires, fire fighters are on call.

Example Titles

- clearing saw operator
- forest fire fighter
- forestry worker
- scarification equipment operator
- silviculture worker
- thinning saw operator

Education and Training

Silviculture and *forestry workers* are usually required to have grade 12, and for some positions completion of a relevant college program may be necessary. Experience as a logging or forestry labourer may be required. Training is primarily on the job under the supervision of experienced workers.

Planting trees requires a strong back and an ability to work in isolated areas for extended periods of time. Formal training in power saw operation and maintenance is usually provided. To advance to a more senior position, completion of a two-year college diploma program in forest resources or renewable resource technology may be required. See the profile Forestry Technologists and Technicians (2223) for details about forestry technology diploma programs. These diploma programs generally require grade 12, including prerequisite courses in mathematics, science and English.

Those interested in a lifelong career in forest fire fighting should complete a diploma or undergraduate program in forestry. They should have an aptitude for science and mathematics and enjoy activities of a technical nature (for example, the use of two-way radios, meteorological instruments and timber measuring devices). They require good spatial perception, physical strength and agility in order to climb and balance when moving over rough terrain. They also need an ability to conduct surveys, inventories and field measurements and to plan, monitor and coordinate activities. Good analytical and communications skills are necessary.

Those interested in forest fire fighting on a seasonal basis do not require any specific education, although completion of fire prevention courses offered at several B.C. colleges and universities as part of the B.C. Forests Continuing Education program may be helpful. The Ministry of Forests recruits people who are at least 18 years old, physically fit and agile, interested in forestry and able to work as a member of a team. On-the-job training is then provided.

Firefighters are expected to maintain a high level of physical fitness. Through experience and continued training they can specialize. For instance, some firefighters become members of a specialized rapattack crew who rappel from helicopters to help curb fires.

There are no specific educational requirements for detection assistants (those who help identify fires from fire lookouts, airplanes or vehicles). The Ministry of Forests usually hires people who have completed grade 12, are physically fit with good eye sight and have a willingness to work in isolated areas for up to three weeks. On-the-job training includes learning observation skills for locating fires, fire reporting and safety procedures, terminology and technical skills for using a variety of fire tracking and communications equipment. Those interested in fire detection work should be conscientious, responsible and able to think and act quickly.

Firefighters are occasionally required to work as detection assistants, and vice versa. Therefore, multiple skills and flexibility are increasingly important for these people.

Generally, these workers should enjoy working as a member of a team, usually in an isolated area. They should like carrying out routine and organized work in the outdoors. They must be able to perform under stress when confronted with critical or unexpected events. Good communication skills and basic analytical skills are important.

Working Conditions

Workers should be prepared to bend, stoop, crouch and carry heavy equipment and supplies. They often must walk and move very quickly over steep and uneven terrain. This type of work requires physical fitness and endurance. The hours of work for these workers are usually more than 40 hours a week, with weekend shifts as required.

Most work, because it is in remote areas, involves living in a camp situation. Workers are outdoors and exposed to extreme temperatures and weather conditions. For example, forest fire fighters are exposed to smoke, intense heat and fumes.

Silviculture and *forestry workers* earned an annual average of $18,500 in 1995. About 13% worked full time, full year, and these workers earned an annual average of $45,400. The respective all-occupation averages in the province in 1995 were $27,900 and $39,400.

This is a large occupational group, which saw an increase in the number of workers from 2,680 in 1990 to 6,180 in 1998. Self-employed silviculture and forestry workers are very scarce at 6%, which is well below the provincial average of 15%. The proportion of part-time workers in this group (16%) is lower than the all-occupation average (26%). Most workers are employed full time, but because of the seasonal nature of the occupation, most full-time work is for only part of the year (72%).

The unemployment rate among this occupational group is high, reflecting the seasonal nature of the work. Workers are usually employed during the peak time of spring through to fall. Most employed fire fighters are casual and temporary workers, and the amount of work they do is based on demand.

Silviculture and forestry workers are mainly employed in the professional business services industry (67%), the logging and forestry industry (24%) and a small number in the provincial government service sector (6%). Provincial government employment includes forest fire fighters selected and trained to work with the B.C. Forest Service. Not surprisingly, these workers are located in rural areas of Northern B.C. (39%), the Okanagan/Kootenay region (34%) and on Vancouver Island (17%).

There are fewer women (17%) in this occupational group than the all-occupation average in B.C. (46%). However, their representation has increased, indicating that more women are entering this non-traditional occupational group.

People under the age of 25 make up 27% of workers in this occupational group, which is much higher than the average (15%) for all occupations. This suggests that entry-level positions are available for younger workers, and it also reflects the physically demanding nature of the work.

Employment Prospects

This is a large occupational group, made up of about 6,180 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment in this group to grow at an annual rate of 1.4%, about as fast as the average for all occupations. According to this projection, 2,670 positions will become available from 1998 to 2008. Because the workforce is aging, about two-thirds of these openings are projected to come from the need to replace workers who retire. The remainder will come from growth in the number of new positions.

Employment growth for these workers depends on the amount of reforestation activity. Land use legislation, such as the Forest Practices Code and the Forest Act, requires logging companies to replant all logged areas. The Forest Renewal Plan also invests funds from stumpage fees to create work in other forest renewal activities. Together, these initiatives are intended to ensure that B.C. forests are maintained and renewed. All logging activities must now be followed by reforestation. These initiatives also tie the employment prospects of silviculture and forestry workers to the harvesting levels in the forestry industry. Employment of these workers is also affected by the amount of public and private funding available for enhanced silviculture activities, such as pruning, spacing and thinning young trees.

Several factors are reducing the demand for *silviculture* and *forestry workers*. Land use legislation and environmental concerns are reducing the overall amount of logging activity in B.C. These land use policies include reductions in the allowable annual cut (AAC) and the designation of a growing proportion of B.C.'s land resource for parks or otherwise protected areas. The reduction in logging activity that this entails will reduce the amount of logged areas to replant. With less land available for logging companies to choose from, they will increasingly have to settle for less accessible areas. According to industry sources, these factors, combined with environmental concerns, are causing a growing proportion of logging to be done by helicopter, which allows for the selective cutting of trees. Selective cutting is also becoming a favoured harvesting technique in more accessible areas. This technique reduces the need for replanting and consequently the demand for silviculture and forestry workers.

Although little, if any, growth is expected in logging activities, other sources of employment growth for silviculture and forestry workers are expected to cause their employment to grow at a close to average rate. After forest companies have completed their reforestation obligations, the responsibility for the forest returns to the Crown (provincial government). At this stage, Forest Renewal British Columbia (FRBC) invites proposals from forest companies to conduct further enhanced silviculture work on Crown Land. Work at this stage includes more activities suited to workers in this group, such as pruning, spacing, additional brushing, further replanting, fertilization and cone collecting. This is expected to continue to be a source of employment growth for these workers.

These silviculture and forestry jobs can provide entry into the forest industry. There is some mobility among workers in this group. It is possible to advance to more highly skilled positions with experience and training. For example, workers in this group can advance to the occupation of forestry technician with additional education and experience and from there can advance to becoming a registered professional forester upon completion of a bachelor's degree in forestry. With experience, these workers can also advance to supervisory positions.

People considering entry into this and other forest industry occupations are advised to contact the industry and employers in their region for up-to-date information before making career decisions.

Employers can be found by using the index at the back of the telephone book and by looking in the yellow pages under the headings of forestry or forest service contractors.

Additional Information

Provincial government employment includes forest fire fighters selected and trained to work with the B.C. Forest Service.

Ministry of Forests http://www.gov.bc.ca/for

Forest Renewal B.C. http://www.forestrenewal.bc.ca

Related Occupations

- primary production labourers (861)
- nursery and greenhouse workers (8432)
- chainsaw and skidder operators (8421)
- contractors, operators and supervisors in horticulture (825)
- forestry technologists and technicians (2223)

General Farm Workers

NOC 8431

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	9,550	9,100	8,000

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
-1,100	770	-330

Annual Growth 1998-2008 -1.3%

Main Industries of Employment

Agriculture	98%
Amusement and Recreation Services	1%
Wholesale Trade	1%

Employment by Region

Lower Mainland	42%
Vancouver Island	10%
Northern B.C.	15%
Okanagan/Kootenay	33%

Self-employment 20%

Nature of the Work

General farm worker is a mid-level position in agriculture. General farm workers plant, cultivate and harvest crops, and raise livestock and poultry. *Farm machinery operators* are also included in this group. These workers are employed on livestock, fruit, vegetable and specialty farms.

Main Duties

General farm workers in horticulture operate many types of farm machinery to fertilize, cultivate, harvest and prepare products for the market. They also regulate outdoor irrigation systems, control weeds and identify plants and pests in order to apply pesticides to crops.

Workers on livestock farms clean barnyards and feed animals, such as cattle, hogs, poultry and horses. They may also train, trim and shoe horses, as well as milk, dehorn and brand cattle. Maintenance of farm machinery and buildings may be required on all types of farms, along with the detection of disease and health problems in crops and livestock.

Example Titles

- dairy production technician
- fruit tree pruner
- general farm worker
- harvester machine operator
- irrigator
- ranch hand
- wrangler

8

Education and Training

There are no specific education and training requirements for *general farm workers*. Basic farm knowledge is required, and experience with animals is an asset. Knowledge of the operation, maintenance and repair of machinery, heavy equipment and automated systems may be required. Aptitudes for mechanics and carpentry are strengths. Some knowledge of crops, livestock and/or poultry as well as experience in preparing products for the market are definite assets, as is an ability to detect disease and health problems. Analytical skills and some background in science and mathematics are helpful.

A college certificate or diploma or specialized courses related to farming, such as livestock production, tree pruning and pesticide application, are available and may be required for some positions and are generally advantageous when seeking employment.

The College of the Rockies, Northern Lights College and the University College of the Fraser Valley offer programs in agriculture with courses in livestock production, general agriculture, animal care and farm or ranch practices. Pesticide applicator/dispenser courses are offered throughout the province. The University College of the Fraser Valley has a Milker Training program for dairy workers. Kwantlen University College offers a nine-month Farrier Training program. Admission requires completion of grade 12, at least two years of verified experience handling horses and demonstration of horse handling skills.

Physical fitness is important for general farm workers as is a knowledge of farm safety practices. Good communication skills and adaptability are assets. A willingness to continue learning is needed in order to advance to positions of greater responsibility.

©Stone/Vancouver

Working Conditions

General farm workers do physical work outdoors and in all kinds of weather. The work requires bending, kneeling and lifting. The hours of work may exceed 40 hours a week and require weekend shifts. Many work from sun-up to sundown during the planting and harvesting seasons. During peak production times, workers may work up to 120 hours in a two-week period.

Workers in this occupational group earned an annual average of $11,100 in 1995. Most farm workers (67%) are employed full time, but only 26% of these workers are employed full time, full year. This group earned an average of $20,200. The respective all-occupation averages in the province in 1995 were $27,900 and $39,400.

Industry sources report more favourable earnings are possible than those stated above. Earnings will vary depending on the type of farm, experience, length of employment and responsibilities on the farm. There may also be other benefits, such as housing, free food products and the use of a vehicle.

The number of workers in this large occupational group decreased from 9,550 in 1990 to 9,100 in 1998. The rate of self-employment (20%) is above the all-occupation average (15%) because farmers are not included in this group (see NOC 825). There are more part-time workers (33%) than the average for the B.C. workforce (26%).

The unemployment rate among workers in this group is high, reflecting the seasonal nature of the work. Peak times occur during warm weather months and harvesting times. However, on farms that raise animals for meat or dairy products, work goes on constantly throughout the year. Often full-time work is available on the farm for six to seven months a year, and many workers may have second jobs off the farm. Employer demand is affected by weather fluctuations and general business conditions.

Most general farm workers are employed in the agriculture industry (98%). There is a higher than average share in the Okanagan/Kootenay region (33%), compared to the workforce average of 15%. This reflects the intensive agriculture that takes place in the Okanagan. There is also a slightly higher than average share of these workers in Northern B.C. (15%), compared to the B.C. workforce average of 10%. In comparison to the regional distributions of B.C.'s overall workforce, there are lower than average shares of workers in the Lower Mainland (42%) and on Vancouver Island (10%). It is important to note that the type of farm work varies depending on the region.

There are more women (40%) in this occupational group than in other primary industry occupations. However, this proportion is still slightly less than the 46% average for all occupations.

Workers under the age of 25 make up about three-tenths of those employed in this group, compared to the all-occupation average of 15%. This large proportion of younger workers suggests that entry-level positions are available.

Employment Prospects

This is a large occupational group in B.C., made up of about 9,100 workers in 1998. The Canadian Occupational Projection System (COPS) projects employment of these workers to decline through to 2008. This employment loss is expected to exceed the number of openings resulting from retirements. However, because of the large size of this occupational group, many additional employment opportunities will result from worker turnover.

Almost all of these workers are employed in the agricultural industry. Growth in this industry very much determines the rate of employment growth for these workers overall. Employment growth in this industry is expected to be slower than the all-industry average through to the year 2008. There are many factors responsible for this, including global competition, trade agreements, a limited land base available for new agriculture, new technology and concerns about the environment. A related occupation in this industry that is expected to see employment growth is that of Nursery and Greenhouse Workers (see profile NOC 8432).

Technological changes in machinery, production and harvesting are creating demands for fewer but more knowledgeable and highly trained workers. For example, B.C. chicken producers have applied computer technology to control the barn environment and maximize production efficiency. Industry sources report that a growing number of agricultural employers require potential employees to have formal training and on-the-job experience in a variety of areas.

Fewer trade barriers and reduced global production costs also affect the profitability of B.C. farms and, as a result, the employment of general farm workers. B.C. farmers must deal with a growing season that is much shorter than that of competitors, such as California. They are working to compete constantly by investing in better equipment, new fertilizers, pest control and other new technologies. Especially in the winter, people eat produce that is grown in California and shipped to B.C. To compete, farmers need to emphasize quality and efficiency. Some farmers are shifting to greenhouse production as well as to specialty vegetables in order to develop market niches.

Advancement into supervisory positions is possible with experience.

Additional Information

Ministry of Agriculture, Food and Fisheries
http://www.gov.bc.ca/agf

Agricultural Workforce Policy Board (AWPB)
http://www.island.net/~awpb

A detailed inventory of training programs and courses for agricultural training (including horticulture) in B.C. is available from the Agriculture Work Force Policy Board. Copies are available by writing the Board at 2795 Grafton Avenue, Qualicum Beach, B.C., V9K 1W8 or call (250) 752-1564.

Agricultural Labour Pool http://www.agri-labourpool.com

Related Occupations

- primary production labourers (861)
- nursery and greenhouse workers (8432)
- silviculture and forestry workers (8422)
- contractors, operators and supervisors in agriculture, horticulture and aquaculture (825)

Nursery and Greenhouse Workers

NOC 8432

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	5,240	5,200	5,870

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
670	500	1,170

Annual Growth 1998-2008 1.2%

Main Industries of Employment

Agriculture	46%
Amusement and Recreation Services	11%
Construction	10%

Employment by Region

Lower Mainland	54%
Vancouver Island	18%
Northern B.C.	6%
Okanagan/Kootenay	21%

Self-employment 11%

Nature of the Work

Nursery and *greenhouse workers* are also called horticulture workers. They plant, cultivate and harvest trees, shrubs, flowers, vegetables and plants. *Landscaping workers,* who design and maintain landscapes, are also included in this group. They are employed in container and field grown nurseries, greenhouses, landscaping departments of institutions and private landscaping establishments.

Main Duties

Nursery and *greenhouse workers* prepare soil, transplant plants, apply pesticides, graft plants and transplant seedlings and cuttings. Activities also include regulating greenhouse conditions and outdoor irrigation systems and preparing shrubs, flowers and plants for sale. These workers also stock shelves, serve customers and provide information and advice to the public regarding the selection and purchase of products.

Landscaping and *grounds maintenance workers* perform manual work to assist in the construction and maintenance of lawns, gardens, athletic fields, golf courses and other landscaped areas. They spread top soil, plant flowers, grass and shrubs, and they cut grass, rake, fertilize and perform other maintenance duties. They may also operate power mowers, tractors and snow blowers to clean and maintain landscape environments.

©Stone/Vancouver

Example Titles

- forest nursery worker
- greenhouse worker
- greenskeeper
- horticulture technician
- hothouse worker
- landscaping/grounds maintenance worker
- nursery worker
- sod farm equipment operator

Education and Training

On-the-job training lasting from three months to a year is available for those workers in this field who have good reading, writing, comprehension and mathematics skills. However, completion of grade 12 and a relevant college program in horticulture is more common. Physical fitness is necessary. Upgrading and acquisition of new skills is necessary in order to be successful.

Several B.C. colleges offer a horticulture technician program that addresses both landscape maintenance and greenhouse/nursery work. See the profile Landscape and Horticultural Technicians and Specialists (2225) for details about the various programs available as well as information on apprenticeship. College of the Rockies, Malaspina University College, University College of the Cariboo and University College of the Fraser Valley all offer pesticide applicator/dispenser courses.

People entering these occupations must have a good eye for different kinds of plants, be able to monitor plants to keep them healthy and enjoy being outside doing physical labour. They should be dependable, able to take direction and able to work independently or as part of a team. Good communication skills, basic analytical skills, a good memory and some background in science and mathematics are assets. Basic reading and writing skills, as well as a knowledge of computerized systems, are important, as is a willingness to work shifts and weekends.

Working Conditions

Nursery and greenhouse-related workers work in humidity-controlled greenhouses and nurseries. Temperature, ventilation, humidity, light, water and carbon dioxide can all be controlled by computers or workers to produce the best possible growing environment in greenhouses. *Landscape* and *grounds maintenance workers* are outdoors in all kinds of weather.

Most of the work is manual with a strong emphasis on practical hands-on skills, which include bending, stooping, kneeling and lifting. Workers are required to be physically fit, dependable and able to take direction. They must also be able to work independently or as part of a team. Hours of work may exceed 40 hours a week, and weekend shifts may be required. Those who are self-employed in landscaping have the freedom to set their own hours.

Workers in this occupational group earned an estimated average of $13,400 in 1995, which is well below the provincial average of $27,900. Those who worked full time, full year earned $23,100, which is also below the provincial average of $39,400.

This is a large occupational group. The number of workers employed has decreased slightly from 5,240 in 1990 to 5,200 in 1998.

The rate of self-employment for this group (11%) is slightly lower than the provincial average (15%). People in these occupations often open companies of their own. Industry sources report that self-employment opportunities are better in landscape and grounds maintenance than in nursery and greenhouse operations.

The proportion of part-time workers (29%) is slightly higher than the 26% workforce average, and industry sources feel that there is a trend toward more part-time and temporary work. Similar to other seasonal workers, 48% of this group are employed full time but for only part of the year. Industry sources expect the number of contract and temporary positions to increase.

The unemployment rate for this group is about the same as the average for all occupations, reflecting the seasonal nature of the work. Because these occupations are highly seasonal, work is concentrated in a four- to ten-month period. Employment peaks during the warm weather months and offers opportunities for individuals seeking summer employment. Work can range from a few days to several months during the growing season, depending on the region. Employment demand for workers is also affected by weather and economic market conditions.

Most of these workers are employed in the agriculture industry (46%). The rest are in the construction industry (10%) and in amusement and recreational services (11%). Higher than average shares of workers are located on Vancouver Island (18%) and in the Okanagan/Kootenay (21%). The Lower Mainland, with 54% of these workers, has a slightly smaller than proportional share.

This occupational group has almost an equal number of women and men employed, which is similar to the workforce average. Almost 27% of these workers are under the age of 25. This high proportion of young people suggests that entry-level positions are quite common in this occupational group.

Employment Prospects

This is a large occupational group, made up of about 5,200 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment of *nursery* and *greenhouse workers* to grow at an annual rate of 1.2%, slower than the average for all occupations. According to this projection, 1,170 positions will become available from 1998 to 2008. Almost 60% of these openings are projected to result from growth in the number of new positions, and the remainder will come from the replacement of retired workers.

Several factors suggest the employment growth rate of these workers could be higher than the COPS forecasted rate. There is a growing demand for specialty horticultural products, such as various plants and organic foods. This demand is likely to encourage many existing greenhouse operations to expand and new ones to emerge. According to industry sources, the number of greenhouse operations in the Lower Mainland area is expected to increase by 40% to 50% over the next few years.

Advances and growth in the use of technologies will prevent the employment growth of these workers from matching production growth. More highly skilled workers will be required. Computerized climate control and irrigation systems are now being used in many greenhouse operations. However, these technologies have not significantly reduced the need for labour during the harvest season. Nurseries still need workers to maintain and care for plants, flowers and trees.

Some of this work is sensitive to changing economic conditions. For example, growth in landscaping is related to growth in the construction industry. New home owners buy more trees, bushes, plants and flowers to landscape their grounds. When new housing starts are down this has a negative impact on purchases of nursery grown products, but when new housing construction grows there is a positive impact. In addition, nursery workers are needed to monitor seedlings for tree planting used in silviculture.

Advancement to such supervisory positions as greenhouse supervisor or landscaping/grounds maintenance manager is possible with experience and training.

Additional Information

Ministry of Agriculture, Food and Fisheries
http://www.gov.bc.ca/agf

Agricultural Workforce Policy Board (AWPB)
http://www.island.net/~awpb

A detailed inventory of training programs and courses for agricultural training (including horticulture) in B.C. is available from the Agriculture Work Force Policy Board. Copies are available by writing the Board at 2795 Grafton Avenue, Qualicum Beach, B.C., V9K 1W8 or call (250) 752-1564.

Agricultural Labour Pool http://www.agri-labourpool.com

Related Occupations

- primary production labourers (861)
- public works labourers (in 76 trades helpers, construction labourers and related occupations)
- silviculture and forestry workers (8422)
- contractors, operators and supervisors in agriculture, horticulture and aquaculture (825)

Fishing Vessel Deckhands

NOC 8441

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	1,290	510	400

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
-110	190	80

Annual Growth 1998-2008 -2.4%

Main Industries of Employment

Fishing and Trapping	90%
Fish Products Manufacturing	3%
Wholesale Trade	3%

Employment by Region

Lower Mainland	29%
Vancouver Island	54%
Northern B.C.	16%
Okanagan/Kootenay	0%

Self-employment 18%

Nature of the Work

Fishing vessel deckhands perform a variety of manual tasks on commercial fishing voyages, and they maintain fishing vessels. These workers are mostly employed by companies operating commercial fishing vessels, or they are self-employed. This is a very small occupational group.

Main Duties

Fishing vessel deckhands prepare nets, lines and other fishing tackle to catch fish and other marine life. They sort and pack fish in ice. They handle mooring lines and may steer the vessel. They also repair nets, splice ropes, maintain fishing gear and clean surfaces. Deckhands may also aid in interpreting weather and vessel conditions, performing minor repairs and carrying out safety procedures.

Example Titles

- crewman/woman, fishing vessel
- deckhand
- icer, fishing vessel
- netmender, fishing vessel

Education and Training

Usually *deckhands* have a grade 10 education, but there are no mandatory educational requirements. Deckhands need to be skilled in basic nautical skills, safety and survival procedures, tie-up procedures and identifying, sorting and handling marine life. On-the-job training is generally provided by senior crew members on board. With increasing emphasis on safety and the use of written material within the fishing industry, there is an emerging expectation that deckhands, as well as other fishing vessel staff, be able to read and comprehend English.

The Pacific Marine Training Centre, part of the British Columbia Institute of Technology, offers entry-level courses for deckhands and courses in safety, survival, fire fighting and net mending. Camosun College, Kwantlen University College, Malaspina University College, North Island College and Northwest Community College also offer basic marine training. Periodically community education groups also provide basic nautical courses.

Continual upgrading of skills and knowledge is necessary in order to be successful in this field.

Those interested in these occupations should enjoy working outdoors and being physically active. Good eyesight and health are important. These workers must be alert, patient and observant.

Working Conditions

This occupation entails strenuous outdoor work and long hours. Those employed in this group work under various hazardous conditions, such as storms, fog, wind and malfunctioning fishing gear. Deckhands should be aware that medical treatments for serious injuries may have to wait until they can be transferred to a hospital. They should also be aware that fishing trips may require stays of several weeks off-shore, hundreds of miles away from the home port.

Fishing boat deckhands earned an estimated annual average of about $14,100 in 1995. A small number (5%) of these workers were employed full time, full year. They earned an average of $32,800. The respective all-occupation averages in the province in 1995 were $27,900 and $39,400.

However, industry sources report that these earnings are a little higher than their earnings estimates. These sources report that workers earn an annual average of about $15,000 and that full-time, full-year workers earn between $20,000 and $35,000 per year.

Earnings vary depending on a number of factors, such as the size and type of boat, number of fishing licences, equipment used, fish species sought, allotted quota and market price for the catch. Fishing crew are often paid a percentage of the catch.

This is a very small occupational group that has seen employment loss. There was a drop in the number of workers employed over the past five years, from 1,290 in 1990 to 510 in 1998.

The rate of self-employment (18%) for this group is above the 15% provincial average. This reflects that a number of deckhands work for a share of the catch, though most work as employees.

There is the same proportion of part-time workers (26%) in this occupation as in the average for all occupations in B.C. Like other seasonal workers, most (70%) are employed full time, part year, but some are employed full time for the full year (5%). The large proportion of full-time, part-year workers reflects the seasonal nature of the occupation.

The unemployment rate for deckhands is very much above the provincial average rate, reflecting the seasonal nature of the work and the competition for available work. Employer demand is largely affected by seasonal fluctuations in fish stock levels.

Fishing boat deckhands are mainly employed in the fishing and trapping industry (90%), though a small number (3%) work in the fish products processing industry (for example, on fish processing boats). The remaining deckhands are employed in very small proportions in a variety of industries.

Most of these workers live on Vancouver Island (54%) and in the Lower Mainland (29%), though a significant number live in Northern B.C. (16%). Those workers who reside in urban areas of B.C. may travel to and fish out of remote ports along coastal waters.

There are fewer women (28%) in this occupation than the average for all occupations in B.C. (46%). However, this is still a larger representation for women than in some of the other non-traditional occupations. It also appears that wife and husband work teams are becoming more common.

Fishing vessel deckhands are mostly younger than the workforce average age (38). About one-third of these workers are under the age of 25, reflecting the availability of entry-level positions for younger workers.

Employment Prospects

This is a very small occupational group, made up of only about 510 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects this employment level to decline to 400 by the year 2008. Only 80 job openings are projected to result from the need to replace workers who retire. The low level of openings will mean that finding work in this field is expected to be very difficult. Worker turnover is expected to result in some additional employment opportunities.

Almost all *fishing vessel deckhands* are employed in the commercial fishing industry. Consequently employment growth of these workers is closely related to employment growth in this industry. No growth in employment is projected for the commercial fishing industry through to 2008. This industry has been going through major structural changes that influence the demand for workers. Advances in technology, availability of fish and the laws governing their stocks are all factors that influence the employment conditions in this industry. Conservation concerns have led to strict regulations on the commercial fishing of sockeye, coho and chinook salmon. As a result, the 1998 wild salmon harvest was the lowest in 50 years. Although fish stocks are expected to recover somewhat over the long term, the employment benefits of this are not expected to be felt over the next ten years. Aboriginal land claims and treaty negotiations also may have an impact on the distribution of available fish supply, as well as on who will be employed in the industry.

Increased competition for market share of fish products will have a negative impact on the employment of *fishing vessel deckhands*. Competition for market share comes from other countries and from aquaculture. These competitors can generally produce seafood products at a lower cost.

The B.C. seafood product base potentially could diversify from a predominantly salmon fishery to meet specific domestic and global market demands for other products. For example, flying squid could find a market among a growing Asian population in the Lower Mainland. Other possible market-expanding and diversifying possibilities include scallop, mussels, clams, sea cucumbers, sea urchins and sablefish. However, such diversification will depend on the testing and development of stocks and will take some time to establish.

A growing number of vessels are being equipped with electronic navigational and tracking devices, such as depth sounders and fish finders. Workers must acquire additional skills and knowledge in order to operate these technologies and take on the associated new responsibilities.

Fishing vessel deckhands may advance to *watchkeeper* or mate positions with additional training. It is also possible for these workers to become skippers upon acquiring an entry licence and a boat.

Bearing in mind the competitive employment situation and the poor employment outlook, people considering entry into fishing industry occupations are advised to contact those working in the industry directly, including vessel skippers, masters and fishermen/women, for current information. Employers can be found by using the index at the back of the telephone book and by looking in the yellow pages under fishing companies.

Additional Information

Ministry of Agriculture, Food and Fisheries
http://www.gov.bc.ca/agf

B.C. Council of Professional Fish Harvesters
http://www.northisland.net/bccpfh

BCIT Fish Harvesting and Processing Technology Program
http://www.fishtech.bcit.bc.ca

Fisheries Renewal B.C. http://www.fishrenewal.gov.bc.ca

Related Occupations

- fishing vessel masters, skippers and fishermen/women (826)
- transportation officers and controllers (227)

Primary Production Labourers

NOC 861

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	14,930	18,750	19,630

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
880	3,930	4,810

Annual Growth 1998-2008	0.5%
Main Industries of Employment	
Construction	23%
Logging and Forestry	20%
Other Service Industries	10%
Employment by Region	
Lower Mainland	41%
Vancouver Island	24%
Northern B.C.	13%
Okanagan/Kootenay	22%
Self-employment	14%

Nature of the Work

This group of workers do physical labour to assist in the production, harvesting, construction and extraction of primary resources. These resources include wood, food, fish, metals, oil and gas. These workers are employed by livestock, crop and fish farms. They are also employed in landscaping, mining, drilling and logging.

Main Duties

Harvesting labourers assist other farm workers in the harvesting, production and packing of crates, supplies, fruit, produce, livestock and poultry.

Landscaping and *grounds maintenance labourers* spread soil, lay sod and plant flowers, grass, shrubs and trees. Their duties also include controlling insects and diseases, maintaining lawns, weeding gardens, and pruning shrubs and trees using power maintenance equipment. They are employed by lawn care companies, golf courses, cemeteries and the landscaping departments of government and private establishments.

Aquaculture harvest support workers feed, vaccinate and mark fish stocks. They must watch for and report irregularities in the stock. They may have to scuba dive to clean the aquaculture cages. They also maintain pumps, filters and aquaculture enclosures. In some cases they prepare stocks for market. These workers are employed by fish hatcheries and commercial aquatic farms. Marine plant gatherers and shellfish diggers are also included in this group.

Labourers in *mining* and *drilling* maintain work sites, handle materials and assist in setting up, taking down and transporting equipment. They may drive trucks to transport materials and equipment. These workers are employed by coal and mineral mines, drilling servicing contractors and petroleum producing companies. Labourers who assist in geophysical prospecting for oil and gas are included in this group.

Logging and *forestry labourers* attach choker cables, plant trees, clear brush, spray chemicals, clean up landing areas and assist other workers in woodlands operations. They are employed by logging companies and contractors.

©Stone/Vancouver

Example Titles

harvesting labourers (8611):
- crop farm labourer
- fruit picker
- vegetable packer

landscaping labourers (8612):
- grounds maintenance worker
- landscape labourer
- sod layer

aquaculture labourers (8613):
- fish farm helper
- fish tagger
- marine plant gatherer
- oyster picker

mining and drilling labourers (8614):
- leasehand
- service rig helper
- shakerhand

forestry labourers (8616):
- chokerman/woman
- logging labourer
- tree planter

Education and Training

Labourers in *agriculture* may require some secondary school education. Usually some farm-related experience is required. Mechanical skills are often of value and related training is a strong asset.

Labourers in *horticulture* and *landscaping* may require some secondary school education, and some related experience and knowledge of plants is usually preferred. Employers increasingly are seeking staff with some training in horticulture, such as the one-year technician programs offered by Camosun College, College of the Rockies, Kwantlen University College, Malaspina University College, University College of the Cariboo and the University College of the Fraser Valley. See the profile Landscape and Horticultural Technicians (2225) for details on these programs.

Labourers in *aquaculture* generally require completion of a college diploma in a relevant field. Diving training and training in fish husbandry are assets, and a willingness to upgrade skills and knowledge continually is needed. Malaspina University College offers a Fisheries and Aquaculture Technology program of four to five semesters as well as an Aquaculture extension program. The extension courses provide a series of opportunities for industry advancement, technology transfer and technical introductions, and vary in length from one day to three weeks.

North Island College offers a one-year certificate program for Aquaculture and Fisheries Technicians. The program mainly addresses culture, enhancement and management of salmonid fishes, but also includes culture of oysters and scallops and an overview of the general field of aquaculture. Capilano College offers a similar program, and graduates receive a Fish Culture Technician certificate. This program is available in distance learning format only and is designed for those who are currently working or seeking employment in the fish culture field and wish to upgrade their academic credentials. Applicants to both programs must have grade 12 or be 18 years of age.

The British Columbia Institute of Technology offers a Fish Harvesting and Processing Technology program. There are eight courses in the program varying in length from 7 to 48 hours.

Mine labourers usually require grade 10, with grade 12 preferred. On-the-job training is provided by each company, and the length of training varies depending on the type of equipment used and the type of ore being mined.

Oil and *gas drilling, servicing* and *related labourers* generally must have secondary school and some on-the-job training. Certification in the Workplace Hazardous Materials Information System of the Workers' Compensation Board, as well as other safety procedures, may be required.

Logging and *forestry labourers* generally do not require any formal education, although completion of secondary school and pre-employment safety courses may be required for some positions. Several weeks of formal and on-the-job training are provided. Various safety procedure certificates may be required. Logging and forestry labourers must have manual dexterity, physical strength and coordination. Good communications skills, basic analytical skills and an ability to carry out instructions are all required. Some knowledge of automated and computerized machinery is an asset.

Working Conditions

Workers in this unit group perform physically demanding duties outdoors in all weather conditions. They may carry heavy objects, stoop, kneel, crouch or crawl in awkward positions. Some labourers work around crops, livestock and fish, whereas others work around large pieces of machinery and equipment.

Some workers may work around harmful chemicals, fumes, odours, loud noises or dangerous machinery. Avoiding injury becomes easier with experience, but there are many other preventive factors that are extremely important. Workers must use caution and proper safety measures. These include wearing hard hats, eye and hearing protection, safety clothing and boots.

Hours of work may exceed 40 hours a week, and weekend shifts may be necessary during periods of peak production. Labourers are sometimes required to work longer hours when the weather is good.

The estimated average annual earnings for all labourers in this occupational group were $15,000 in 1995. About 16% were employed full time, full year, earning an average of $31,200. However, higher earnings are possible depending on experience, length of employment and work responsibilities. The respective all-occupation averages in the province in 1995 were $27,900 and $39,400.

Human Resource Centres of Canada (formerly Canada Employment Centres) reports indicate the following wide range of wages. In 1995 non-union wages for agriculture and horticulture labourers ranged from $7 to $12 per hour. Non-union forestry-related labourers earned about $7 to $20 per hour, or they were paid based on a piece rate.

There has been a small increase in the numbers employed in this occupational group, from 14,930 in 1990 up to 18,750 in 1998. This remains a very large occupational group.

Self-employment (14%) is about the same as the 15% provincial self-employed average. The rate does vary by occupation within this group. For example, landscaping workers have a higher rate of self-employment (21%).

The level of part-time work (31%) is above the average for all occupations in B.C., while most workers are employed full time for part of the year (53%). The unemployment rate for this group is more than double the provincial average, reflecting the seasonal nature of the work. Employment tends to peak during warm weather months and offers opportunities for individuals seeking summer employment.

Workers in this occupational group are mainly employed in construction (23%), logging and forestry (20%), other service industries (10%), agriculture (10%), grounds maintenance at amusement and recreational parks (8%) and personal and household services (3%).

A lower than average proportion of this group work in the Lower Mainland (41%). A higher than average proportion work in the Okanagan/Kootenay region (22%), on Vancouver Island (24%) and in Northern B.C. (13%). Workers may find themselves working in rural and isolated areas of B.C., although they may reside in urban areas.

There are fewer women (23%) in this occupational group than the average for all occupational groups (46%). However, women have shown an increasing representation over the years. Women work mostly as harvesting, landscaping and grounds maintenance labourers.

This is a very young occupational group. Workers under the age of 25 make up 34% of all workers in this group, compared to the provincial average of 15%. Such a large proportion suggests that entry-level positions are widely available for younger workers. These labour opportunities are considered to be valuable entry-level positions.

Employment Prospects

This is a very large occupational group, made up of about 18,750 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects very little change in this level of employment through to 2008. According to this projection, a total of 4,810 positions will become available from 1998 to 2008. As a result of an aging workforce, over 80% of these openings are projected to come from the need to replace workers who retire. The remainder are projected to come from growth in the number of new positions. Many additional employment opportunities will come from a high rate of worker turnover in this occupational group.

Although this occupational group includes a large variety of workers, most of these workers are *landscaping labourers*. Employment of these landscaping workers is projected to grow about as fast as the average for all occupations but faster than all other occupations in this group. Consequently almost all of the projected openings for this occupational group are for positions in this field. Their employment growth is linked to employment growth in the construction industry, which is also projected to grow at an average rate.

Employment of *oil* and *gas drilling, servicing* and *related labourers* is projected to grow about as fast as the average for all occupations. Employment levels for all other occupations within this group are projected to decline.

Employment growth of oil and gas drilling, servicing and related labourers is closely related to the expected high employment growth in the oil and gas industry. Industry officials expect that the planned $25 billion of investment over the next ten years will result in a doubling of gas and oil production. According to industry analysts, an average of 400 oil and gas wells were drilled annually in B.C. over the past decade. They estimate that as many as 700 wells will be drilled in the year 2000 and that this is the beginning of an upward trend. The provincial government recently has announced a series of royalty and regulatory initiatives to help with the goal of doubling natural gas production and increasing investment in B.C.'s oil and gas industry. However, the growing use of labour-saving technologies will prevent employment growth in this industry from matching its growth in production.

B.C. also has vast reserves of oil and gas off its northern coast, which have been off limits for oil and gas companies for almost 30 years because of federal and provincial bans on offshore drilling. There is growing pressure from coastal and northern communities to lift this moratorium on off-shore exploration. This would also be a significant source of employment growth for oil and gas drilling, servicing and related labourers.

Other primary industries in B.C. have undergone restructuring, and major changes will continue to influence employment demand for labourers. These changes include increased mechanization, an increased demand for multi-skilled workers, fluctuating economic conditions and changing business practices.

In addition to seasonal ups and downs, general economic cycles cause employment fluctuations in primary industries on a year-to-year basis. Structural changes in the economy can cause more permanent or longer term changes in employment demands in all industries. For instance, the forest industry is expected to experience little growth in employment from 1998 to 2008. The agriculture industry is projected to grow more slowly than the average for all occupations.

Some labour-intensive jobs will be lost as safer, labour-saving machinery and equipment are increasingly substituted wherever possible. For instance, employment for fallers and buckers is disappearing in some areas of the B.C. interior as forestry equipment takes over much of the falling function. On the other hand, *fruit* and *vegetable pickers* on farms are always needed to harvest because machines generally are not able to perform most of these tasks, especially for berry crops.

Changing business practices in mining and forestry will also affect the demand for workers. Environmental policies and public pressures will regulate operations and harvesting methods. These changes will affect the different types of machinery and workers needed.

Due to changing technology, workers must retrain to acquire new skills and knowledge in order to operate equipment and take on new responsibilities. In the past it was common for workers to perform only specific tasks. However, these specific tasks increasingly are added to other non-specialized workers' duties. Multi-skilling is becoming very important in a technology-driven workplace, and workers need to be able to perform a variety of tasks.

These occupations provide workers with entry-level opportunities that give them a chance to gain valuable work and training experiences. For all of these labourers, advancement to equipment operating positions is possible with experience and seniority. For example, a forestry labourer can advance to more highly skilled positions, such as a silviculture worker or a logging machinery operator. Advancement to technical positions requires completion of appropriate additional education and training.

People considering entry into these occupations are advised to contact the employers and industry representatives in their area for up-to-date information before making career decisions.

Additional Information

For *harvesting labourers*
Agricultural Workforce Policy Board
http://www.island.net/~awpb

A detailed inventory of training programs and courses for agricultural training (including horticulture) in B.C. is available from the Agriculture Work Force Policy Board. Copies are available by writing the Board at 2795 Grafton Avenue, Qualicum Beach, B.C., V9K 1W8 or call (250) 752-1564.

Agricultural Labour Pool http://www.agri-labourpool.com

For *aquaculture labourers*
BCIT Fish Harvesting and Processing Technology Program
http://www.fishtech.bcit.bc.ca

For *labourers in mining and drilling*
Mining Industry Training and Adjustment Council
http://www.mitac.ca

Mining Association of B.C. http://www.mining.bc.ca

Related Occupations

harvesting labourers:

- general farm workers (8431)
- fishing vessel deckhands (8441)
- contractors, operators and supervisors in agriculture, horticulture and aquaculture (825)
- fishing vessel skippers and fishermen/women (826)

landscaping labourers:

- nursery and greenhouse workers (8432)
- landscape and horticulture technicians (2225)
- public works labourers (in 76 trades helpers, construction labourers and related occupations)

mining and drilling labourers:

- mine service workers and operators in oil and gas drilling (841)
- underground miners, oil and gas drillers and related workers (823)

forestry labourers:

- silviculture and forestry workers (8422)
- chainsaw and skidder operators (8421)
- logging machinery operators (8241)

These occupations provide workers with entry-level opportunities that give them a chance to gain valuable work and training experiences. For all of these labourers, advancement to equipment operating positions is possible with experience and seniority.

© Stone/Vancouver

9 - OCCUPATIONS UNIQUE TO PROCESSING, MANUFACTURING AND UTILITIES

Skill Level B - Technical, Paraprofessional and Skilled Occupations

923 Central Control and Process Operators in Manufacturing and Processing 552

Skill Level C - Intermediate Occupations

941 Machine Operators and Related Workers in Metal and Mineral Products Processing 555
942 Machine Operators and Related Workers in Chemical, Plastic and Rubber Processing 558
943 Machine Operators and Related Workers in Pulp and Paper Production and Wood Processing 560
944 Machine Operators and Related Workers in Textile Processing 564
945 Machine Operators and Related Workers in Fabric and Leather Products Manufacturing 566
946 Machine Operators and Related Workers in Food and Beverage Processing 569
947 Printing Machine Operators and Related Occupations 571
948 Mechanical, Electrical and Electronics Assemblers 575
949 Other Assembly and Related Occupations 578
951 Welders and Machining, Metalworking, Woodworking and Related Machine Operators 581

Skill Level D - Labouring and Elemental Occupations

961 Labourers in Processing, Manufacturing and Utilities 585

Central Control and Process Operators in Manufacturing and Processing

NOC 923

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	1,510	1,700	1,970

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
270	290	560

Annual Growth 1998-2008	1.5%
Main Industries of Employment	
Pulp and Paper Manufacturing	42%
Gas Distribution Utilities	11%
Professional Business Services	9%
Employment by Region	
Lower Mainland	30%
Vancouver Island	20%
Northern B.C.	34%
Okanagan/Kootenay	16%
Self-employment	3%

Nature of the Work

This group is made up of *central control* and *process operators* who monitor and operate multi-functional machinery and computer panels. These operators process various natural resources, including minerals, metals, petroleum, gas, and pulp and paper. These workers are mainly employed in the pulp and paper products industry in B.C.

Main Duties

The duties of these workers vary, but there are some common ones. They analyse panel indicators, gauges, and video monitors from a central control room to detect malfunctions. They adjust equipment, valves, pumps and controls for processing equipment. They sample products, perform tests, carry out statistical processes and write production logs. At times, they work in teams with shared supervisory responsibilities and may be cross-trained to perform other duties during shift cycles.

Pulp and *paper control operators* control the processing of wood, pulp, paper and other cellulose materials. They are employed by pulp and paper companies.

Petroleum, gas and *chemical process operators* monitor and operate petroleum, petrochemical and chemical plants. They are employed by petroleum and natural gas processing companies, as well as by pipeline, industrial, agricultural and speciality chemical companies.

Example Titles

mineral and metal workers (9231):
- blast furnace operator
- central control caster
- central control room operator

petroleum, gas and chemical workers (9232):
- chemical process operator
- gas plant operator
- refinery operator
- senior operating technician

pulp workers (9233):
- bleach plant operator
- digester cook
- pulping group operator
- thermo-mechanical pulp operator

papermaking workers (9234):
- back tender, paper machine
- beater engineer
- Fourdrinier machine operator
- stock preparation operator

©Stone/Vancouver

Education and Training

Central control and *process operators* usually require completion of grade 12, plus some post secondary education. Many of these occupations require a power engineering certificate or a relevant college diploma. On-the-job training is usually provided. Several years of experience as a machine or process operator with the same company may also be required.

For information on education in power engineering, see the profile Power Engineers (NOC 735).

Operators who work with complex equipment may be required to hold a trade ticket in instrumentation or have experience and post secondary education in electronics, electrical systems, mechanics and/or instrumentation. Specific information about this type of education and training is described in the profiles Industrial Instrument Technicians and Mechanics (NOC 2243) and Electrical and Electronics Engineering Technologists and Technicians (NOC 2241).

Pulp and *paper operators* must usually complete a college program in forest product processing.

The British Columbia Institute of Technology (BCIT) offers a two-year Wood Products Manufacturing program that prepares students to use computerized automated processes to convert raw material into products. Admission requires grade 12, with English 12, mathematics 12 and one science 11, preferably physics. Those who possess initiative, a sense of responsibility and an interest in leadership and teamwork are encouraged to apply. Industrial experience adds strength to an application.

University College of the Cariboo, College of New Caledonia and North Island College all offer 2-year Wood Processing Technology diplomas. Admission requires various science courses at the grade 11 level.

BCIT offers a Chemical Science Technology program that provides a foundation in general science and technology, then allows students to specialize in environmental and industrial chemistry, or pulp and paper. Grade 12, with English 12, mathematics 12 and chemistry 11 is required, and chemistry 12 and physics 11 are recommended.

BCIT also offers a two-year Petroleum and Natural Gas program which prepares graduates for employment in various areas of the oil and gas industry, including exploration and production, transmission and distribution, and manufacturing. Admission requires graduation from high school with English 12, mathematics 12 and either chemistry 11 or physics 11.

A certificate in industrial first aid is highly recommended and often required for most workers in this occupational group. Most B.C. colleges and university colleges offer this certification through their continuing education departments. Large companies offer it as part of orientation training. Certification in the transportation of dangerous goods (TDG), firefighting or the Workplace Hazardous Materials Information System (WHMIS) of the Workers' Compensation Board may also be required.

Individuals who are prepared to learn and have an interest in working with massive systems and complex machines are usually good candidates for positions as central control and process operators. They need to be alert, quick thinking, agile and physically fit. Good vision, excellent hearing, good communication skills and good judgement are important. Good spatial perception also is required. Mechanical aptitude, mathematical ability, analytical ability, hand-eye coordination and manual dexterity are required. Keyboard skills are important for computer use. Operators usually enjoy working on their own and with others, doing precise work, making decisions and solving problems.

Working Conditions

Most people work 40 hours per week, though overtime might be required. The structure of a 40-hour week may vary from operation to operation. Some people work twelve-hour shifts with four days on, rotating with four days off. Some plants and companies operate on shifts during days, nights and weekends.

These workers are employed in various environments, and some workplaces can be noisy, dirty and dusty. Workers may be exposed to the hazards of toxic, flammable or explosive chemicals and gases. Avoiding injury becomes easier with experience, but there are many other preventive factors that are extremely important. Workers must be cautious and use proper safety measures. These include wearing hard hats, eye and hearing protection, safety clothing and boots.

The average earnings for these workers were $52,200 in 1995. People in this occupational group who worked full time for the full year earned about $57,300. The respective all-occupation averages in the province in 1995 were $27,900 and $39,400.

Average earnings vary for each type of central control and process operator, but all were well above the provincial average. Full-time, full-year gas and chemical process operators earned $57,100 on average. Full-time, full-year papermaking and coating control operators earned $57,300. Pulping control operators earned $60,600.

Overall, central control and process operators in manufacturing and processing form a medium-sized occupational group. The group grew slightly from 1,510 in 1990 to 1,700 in 1998. Most of these workers are gas and chemical process operators and papermaking and coating control operators. Self-employment is almost non-existent because these employees work for processing plants and companies.

There is almost no part-time employment among workers in this group. About 98% work full time, even though some may work for only part of the year. Approximately 69% of these workers are employed full time for the full year.

The unemployment rate for this group is below the provincial average. This is a group that has had a shortage of skilled workers in the past. The work is not generally seasonal, but technological change and industry growth are factors that can affect employment.

Workers in this occupational group are mainly employed in pulp and paper (42%) and gas distribution utilities (11%). The rest are employed in the professional business services industry (9%) and in the services incidental to mining (9%).

A much higher than average proportion of these workers is found in Northern B.C. (34%) and on Vancouver Island (20%). There is also a significant share in the Lower Mainland (30%). These regions are home to the majority of the pulp and paper companies in B.C. The Okanagan/Kootenay region only has 16% of central control and process operators.

There are very few women (5%) in this group. They primarily work as gas and chemical process operators and papermaking and coating control operators.

There are also few workers (4%) under the age of 25, which is below the all-occupation average for this age group (15%). This small proportion reflects the fact that these are not entry-level positions. Before being promoted to these central control occupations, workers generally work through less skilled jobs, gain experience and get workplace training. There are more workers (36%) aged 35 to 44 than the all-occupation average for this age range (28%).

Employment Prospects

This is a small occupational group, consisting of 1,700 employed workers in B.C. in 1998. Employment for this group is projected to grow about as fast as average through to 2008, according to the Canadian Occupational Projection System (COPS).

Between 1998 and 2008 it is projected that there will be 560 employment openings province-wide in this occupational group. About 270 positions are expected to become available due to growth, and 290 positions will result from the need to replace workers who leave the workforce. However, there are different employment growth rates among the occupations in this group. Most of the openings in the group are forecast to be in gas and chemical processing, which is projected to grow faster than the all-occupation average. In contrast, very few openings are expected to become available for pulp and papermaking control operators due to restructuring of the forestry industry and the modernization of processing plants.

A little less than half of the workers currently employed in this occupational group are in the pulp and paper industry. Industry sources agree with the projections that this proportion will decline through to 2008. This is due to a number of related factors, which continue to change and cause downward pressure on employment in most parts of the B.C. forest industry. These changes include increased use of advanced technology, decreased timber harvest levels and increased international competition from other producers of forestry products.

Technological advancements have led to higher production levels with fewer but more highly skilled workers. Industry sources have indicated that because most equipment adjustments are made from the control room, a whole plant can be operated by a distributing control system (DCS). As a result, fewer specialized equipment control and operating workers are needed to produce the same amount, or more. Consequently strong and adaptable computer skills are becoming essential for workers or potential workers in this field.

There is little mobility among the various types of *central control* and *process operator* occupations. However, with experience, there is mobility among jobs within a company, often as part of a formal development or training program. With experience, operators may also progress to supervisory or managerial positions.

People considering entry into this and other occupations related to the forest industry are advised to contact the industry and employers in their region for up-to-date information before making career decisions.

Additional Information

Communications, Energy and Paperworkers Union of Canada http://www.cep.ca

Ministry of Forests http://www.gov.bc.ca/for

Forest Renewal B.C. http://www.forestrenewal.bc.ca

Related Occupations

- labourers in processing, manufacturing and utilities (961)
- machine operators in pulp and paper and wood processing (943)
- machine operators in metal and mineral production (941)

Individuals who are prepared to learn and have an interest in working with massive systems and complex machines are usually good candidates for positions as central control and process operators. They need to be alert, quick thinking, agile and physically fit.

Machine Operators and Related Workers in Metal and Mineral Products Processing

NOC 941

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	4,280	3,280	3,670

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
390	350	740

Annual Growth 1998-2008 1.1%

Main Industries of Employment

Non-Metallic Minerals	26%
Construction	23%
Non-Ferrous Manufacturing	22%

Employment by Region

Lower Mainland	52%
Vancouver Island	9%
Northern B.C.	12%
Okanagan/Kootenay	27%

Self-employment 8%

Nature of the Work

Workers in this group operate process control machinery and use hand tools to process metal and minerals. They produce metal, glass, concrete, clay and stone products.

Main Duties

Each trade or speciality in this group has different duties, but there are some duties that are the same. These workers set up and operate machines, as well as perform ongoing machine adjustments. They observe gauges, computer printouts and video monitors to verify specified processing conditions. They check for quality control, record production information and complete reports. They also operate multi-function process control machinery through control panels and computer terminals.

Machine operators in *metal* and *mineral processing* operate machinery to grind, filter, mix, melt, treat, cast, roll and refine mineral ores. In B.C. this may be aluminium, lead, zinc, etc. This work is part of a larger production process to process mineral ore and metal products. These workers are employed in mineral and metal processing plants and refineries.

Foundry workers make moulds and cores by hand or machine. They cast molten metal and operate furnaces to produce metal forms. They are employed by metal foundries and departments of metal products manufacturing companies.

Glass forming machine operators operate machines that press or blow molten glass into moulds to shape bottles, jars and drinking glasses. They also spray moulds with oil solutions to finish the glass. They are employed by glass and glass products manufacturing companies.

Glass finishing machine operators operate machines to grind, drill, sand, bevel, decorate, wash or polish products. Glass cutters cut flat glass of various thickness to specified sizes and shapes by hand. They are employed by glass and glass products manufacturing companies.

Concrete products workers construct models and moulds by hand or with tools for casting. They build and repair wooden forms and position reinforcing rods or wire mesh for pouring concrete into the moulds. They also manoeuvre castings by operating cranes or forklifts.

Concrete products machine operators set up, adjust and operate machines to drill, grind and cut concrete to specifications. Clay products machine operators operate mechanical or hydraulic rams and hot-presses to form pottery and porcelain ware. They operate kilns to bake clay products to specific hardnesses. They make jugs, cups, sinks and toilet bowls.

Stone forming and *finishing workers* operate saws to cut blocks of stone to specific dimensions. They operate machines and equipment to grind and polish surfaces. They also cut inscriptions or designs into stone. All of these specific workers are employed by concrete, clay and stone products manufacturing companies.

Inspectors and *testers* examine products to make sure that they are up to standards. They grade and label materials and take samples during or after operations for routine laboratory analysis. They also advise machine operators and supervisors of problems and product deficiencies.

Example Titles

mineral and metal workers (9410):
- furnace charger
- lead refiner
- steel roller

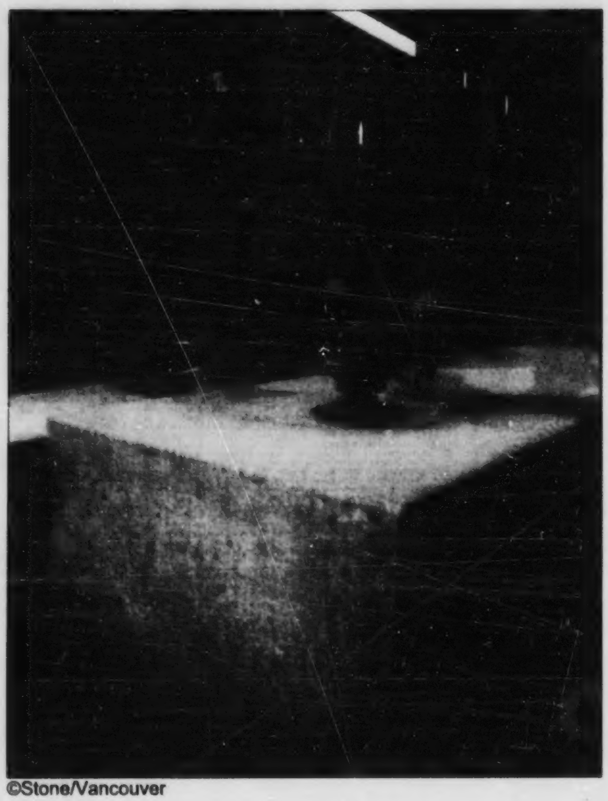
foundry workers (9412):
- apprentice moulder and coremaker
- casting machine operator
- ceramic mould maker
- furnace operator - foundry
- metal caster

glass forming and glass cutters (9413):
- bottle machine operator
- glass pressing machine operator
- glass finishing machine operator
- mirror maker

concrete, clay and stone workers (9414):
- apprentice aggregate plant operator

- apprentice concrete plant operator
- apprentice mould maker
- clay press operator
- concrete block maker
- moulder, clay products
- stone cutter

inspectors and testers (9415):
- clay products grader
- glass inspector
- mineral sampler
- sheet steel inspector


©Stone/Vancouver

Education and Training

Some secondary school is required, and on-the-job training of a few months to two years is provided for machine operators in mineral and metal processing. Experience as a labourer or a helper in a relevant area may be required. Ongoing training may be provided by industry employers.

Inspectors and testers in this group usually require experience as machine or process operators. Graduation from high school is generally required of those who advance to positions that involve inspecting finished products.

These workers need to be able to follow both written and verbal instructions and should be detail oriented and methodical.

Working Conditions

These workers are employed in various processing plants where it can be noisy, dirty, dusty and hot. These plants can be dangerous places to work, and employees may be exposed to extreme temperatures. Workers must wear coveralls, gloves, eye and ear protection, hard hats and steel-toed boots.

Most workers work 35 to 40 hours per week. Some processing plants operate on shifts, and workers will have to work nights, days or weekends. Collective agreement arrangements between employers and trade unions often include a union security provision. This requires union membership as a condition of employment.

Overall, these workers earn above-average wages. Workers in this group earned an average of $31,200 in 1995, which is higher than the provincial all-occupation average of $27,900. Full-time, full-year workers averaged $38,400, which is lower than the provincial average of $39,400.

There are differences in the full-time, full-year salary for each specific occupation in this group. Mineral and metal processing machine operators earned the most, at an average of $48,500 for full-time, full-year work. Industry sources suggest that entry-level workers can earn between $21,600 and $26,400 per year, while experienced workers can earn between $28,800 and $48,000.

Full-time, full-year inspectors and testers in this occupational group earned $38,800 in 1995. Foundry workers earned $42,900. Concrete, clay and stone forming operators earned below-average wages, at $33,400, as did glass forming machine operators and glass cutters at $25,600.

This is a medium-sized occupational group that has decreased in numbers from 4,280 in 1990 to 3,280 in 1998. Mineral and metal processing machinery workers make up the largest proportion (28%) of this group. Foundry workers account for 14% of this group, 18% are glass forming workers and cutters, and 34% are concrete, clay and stone workers. The smallest occupation in this group is that of inspectors and testers, making up only 7% of the occupational group. The large proportions of workers in mineral and metal processing and foundry work reflect the importance of the mining and ore processing industry in B.C.

Self-employment is reported to be 8% for the whole group, which is below the workforce average of 15%. However, industry sources indicate that the level of self-employment might be higher. There are also differences in self-employment levels among the specialities. For example, concrete, clay and stone forming operators reported about 20% self-employment, whereas only 1% of machine operators in mineral and metal processing are self-employed.

Most of these workers are employed full time with the majority working full time for the entire year. Part-time work is not very common at 11%, which is below the workforce average of 26%.

The unemployment rate for this group is about the same as the provincial average, reflecting that employment is affected by the fluctuating business cycle. Industry sources agree that employment demand is influenced by demands for manufactured products.

Workers in this group are mainly employed in mineral and metal processing industries. Specifically, 26% work in manufacturing non-metallic minerals, which include clay, concrete, glass and lime. Others work in construction (23%) and manufacturing non-ferrous primary metals (22%), which consist of aluminium and copper products. A small proportion are employed in metal fabrication (6%), which consists of structural and architectural metal products.

Workers are more likely to find work in the Lower Mainland and Okanagan/Kootenay than in other regions of B.C. The Lower Mainland employs about half of these workers. The Okanagan/Kootenay region employs about one-quarter of these workers (27%), which is almost double its 15% share of the total workforce. Northern B.C employs 12% of these workers, and Vancouver Island employs the remaining 9% of these workers.

The proportions of specific occupations vary from region to region. The occupations that are most prevalent in the Lower Mainland and Okanagan/Kootenay are machine operators in mineral and metal processing, glass processing machine operators, and inspectors and testers. Foundry workers and concrete, clay and stone forming operators are both more likely to find employment in the Lower Mainland.

A majority of workers in this occupational group are men. Women make up about 10% of these workers, which is below the 46% average share for women in all occupations. Most of the women employed in this group work as glass machine operators and glass cutters, or as machine operators and related workers in metal and mineral products processing. The age distribution of this occupational group is similar to the B.C. all-occupation average.

Employment Prospects

Projections from the Canadian Occupation Projection System (COPS) call for a growth rate of 1.1%, slower than the average for all occupations. However, as this is a medium-sized occupational group, it is expected that 740 positions will become available from 1998 to 2008. These openings will be split almost equally between openings due to new jobs growth and openings due to people retiring.

There are a number of different types of workers within this occupational group, including concrete, clay and stone form workers (who make up 33% of this group), mineral and metal processing machine operators (28%), glass forming and finishing machine operators and glass cutters (18%), foundry workers (14%) and inspectors and testers, mineral and metal processing (7%). The proportion of employment openings from each of these sub-groups to 2008 are closely tied to their relative sizes.

Work prospects for *concrete, clay* and *stone forming operators* are influenced mainly by the non-metallic mineral product industries, which produce clay products, structural concrete, ready-mix concrete and other concrete products. Because most of these products are used in construction, the boom and bust cycle of the construction industry greatly affects the employment demand for these workers.

Employment opportunities for *machine operators* in *mineral* and *metal processing* are affected mainly by global mining activity because ore is imported from many sources all over the world to processing plants and refineries in B.C. This is partly due to the low cost and availability of electricity in B.C. In addition, large amounts of particular types of ore are mined and processed in B.C. Employment growth in the mineral processing sector is dependent on mineral prices remaining relatively strong as well as on anticipated investment in the sector. Both of these factors historically have been subject to a lot of change.

The fewest openings are expected to become available for *glass forming* and *finishing machine operators* and *glass cutters*. This is due in part to their relatively small size. This occupational group will also experience a relatively low employment growth rate, as the duties that these workers perform are very computer oriented and easily automated.

Foundry worker employment openings are mainly affected by the primary metal (ferrous and non-ferrous) and metal fabrication industries. Expected growth opportunities may be offset by increased automation and mechanization in the foundries. Foundries are becoming more dependent on machinery and equipment, rather than, for example, having workers pour hot liquid metals directly into moulds. In today's technologically changing workplace, workers must retrain, acquire new skills and knowledge, and be versatile.

Demand for *inspectors* and *testers* is influenced by the full range of industries employing workers from this occupational group, including professional business services and metal fabrication. Employment of these workers is affected mainly by levels of production in the various industries, but it is affected also by technology that allows for better and different forms of quality control.

These workers may progress to supervisory positions with experience and training. Mobility is possible between occupations within each manufacturing plant, but there is little or no mobility between the different manufacturing sectors that employ these workers.

Employment opportunities are advertised in manufacturing plants and newspapers, or they can be found by contacting the unions.

Additional Information

For *mineral and metal workers* and *foundry workers*
Canadian Steel Trade and Employment Congress (CSTEC)
http://www.cstec.ca

Related Occupations

- labourers in processing, manufacturing and utilities (961)
- neon sign maker (in 948 mechanical, electrical and electronics assemblers) quality control technologist and technician (in 221 technical occupations in physical sciences)

- stone carver, hand and craft potter, and glass blower (in 524 creative designers and craftspersons)
- masonry and plastering trades (728)
- glaziers (in 729 other construction workers)
- central control and process operators (923)
- sculptor (in 513 creative and performing arts)

Machine Operators and Related Workers in Chemical, Plastic and Rubber Processing

NOC 942

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	1,540	1,660	1,880

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
220	270	490

Annual Growth 1998-2008 1.3%

Main Industries of Employment

Plastics Manufacturing	34%
Chemicals Manufacturing	12%
Water and Other Utilities	11%

Employment by Region

Lower Mainland	71%
Vancouver Island	10%
Northern B.C.	5%
Okanagan/Kootenay	13%

Self-employment 3%

Nature of the Work

Processing plants employ workers to operate and monitor the machines that control industrial processes. Workers in this category work in chemical, plastics and rubber manufacturing and include *chemical plant machine operators, plastics processing machine operators* and *rubber processing machine operators.*

Water plant and *waste plant operators* who work for municipal governments and industry are also included in this group.

Main Duties

These workers set up and monitor the machines to ensure that their products meet rigid specifications. In the chemical and rubber industries, they add inputs according to a given formula, and in water and sewage treatment plants, they monitor and test the output to ensure that it meets prescribed standards. This may involve the use of computerized control systems. Based on the results of the tests, they adjust the machines to achieve quality goals. They troubleshoot minor problems with the machines and train new staff.

Chemical plant machine operators monitor and operate machinery to blend, mix, process and package speciality chemicals, pharmaceuticals, and cleaning and toiletry products. *Plastics processing machine operators* set up and operate plastic mixing, calendering, extruding and moulding machines. Some *rubber processing machine operators* run machines to assemble rubber products, while some workers inspect products.

Water plant operators monitor and operate computerized control systems and related equipment in water filtration and treatment plants. *Waste plant operators* monitor and operate computerized control systems and related equipment in waste water, sewage treatment and liquid waste plants.

All workers are required to learn about the machines they are operating. Increasingly, this means becoming more familiar with the computer technology used to control the industrial processes. Companies may offer on-the-job training to employees who have an aptitude for the work.

Example Titles

chemical machine operators (9421):

- blender - chemical processing
- capsule machine operator
- evaporator operator - chemical processing
- granulator machine operator
- mixer - chemical processing
- screener - chemical processing

plastics machine operators (9422):

- bag machine operator
- banbury operator
- blow moulding machine operator
- calender operator
- solution mixer operator

rubber machine operators (9423):

- assembler, rubber good
- banbury operator
- calender operator
- cure operator
- inspector, rubber manufacturing
- rubber processing machine operator

water and waste treatment plant operators (9424):

- sewage plant operator
- waste water treatment plant operator
- water filtration plant operator
- water treatment plant operator

Education and Training

Completion of secondary school is usually required for all occupations within this group. Mixer and blender operators in chemical plants receive on-the-job training, whereas operators working in pharmaceutical, explosives and agricultural chemical or specialty chemical plants may require post secondary education or company training. Previous experience in chemical products processing as an assistant, labourer or helper may be required.

The Chemical Science Technology program at the British Columbia Institute of Technology (BCIT) may lead to work as an operator. This program provides a strong foundation in general science and technology, then allows students to specialize in environmental and industrial chemistry, or pulp and paper. Grade 12, with English 12, mathematics 12 and chemistry 11, is required for admission, and chemistry 12 and physics 11 are recommended. Upgrading is available at all public colleges.

Those seeking work as *plastics processing machine operators* may be required to have several years of experience as a helper, tender or packer with the same company.

Moulding process operators may need to complete courses in hydraulics, pneumatics and electronics systems.

BCIT offers a Plastics Technology diploma program that provides practical and theoretical manufacturing training in plastic product/mould engineering with emphasis on a thorough understanding of the manufacturing process. Admission requires grade 12, with English 12, mathematics 12 and either chemistry 11 or physics 11. A solid academic background, good communication skills, an ability to work effectively with people and an interest in the challenge of applying ideas to practical situations are all desirable.

Rubber processing machine operators and *related workers* usually require experience as a labourer with the same company and receive on-the-job training.

Water and *waste plant operators* usually require college or industry training courses in water treatment pollution control. On-the-job training is provided. Previous experience as a labourer or utilities maintenance worker with the same employer may also be required.

BCIT, Camosun College and Okanagan University College offer civil and structural technology diploma programs that provide students with the knowledge and skills needed in water and waste plant operation. The BCIT program offers a specialization in Water Resources. Both Camosun College and Okanagan University College programs include a cooperative education option. Admission requirements for these programs include grade 12, with a strong background in mathematics, physics and English.

Okanagan University College also offers a Water Quality Technology Diploma program, with specialties in water and waste water technology or environmental monitoring. Grade 12, with chemistry 12, mathematics 11 or algebra 12, or equivalent, is required for admission.

Workers in these occupations generally need good eyesight and colour vision, good hearing, mechanical aptitude and an ability to climb ladders. They should enjoy working on their own, making decisions and doing precise work. Certification in the transportation of dangerous goods (TDG), industrial first aid, firefighting, or the Workplace Hazardous Materials Information System (WHMIS) of the Workers' Compensation Board may also be required.

Working Conditions

As these are often factory jobs, most operators work indoors. Some operators work in clean, climate-controlled environments. Others may be exposed to fumes and need to wear safety equipment. Those employed in this group work a 35 to 40 hour week, but may be subject to shift work in factories that run more than one shift.

The average estimated earnings of workers in these occupations in 1995 were $28,400, close to the workforce average of $27,900. However, full-time, full-year workers averaged $34,600, which was less than the comparable average for the workforce as a whole ($39,400). These are generally stable jobs, and most of the workers in this group are employed full time.

There is a large discrepancy between the earnings of men and women in this group. Men earned $31,100 on average, compared to $16,700 on average for women. Most of the women are plastics processing machine operators, which is the most poorly paid occupation in this group, and a higher proportion of women (11%) than men (5%) work part time. The average wages for men and women in this occupational group in 1995 were as follows.

	MEN	WOMEN
Chemical	$34,200	$8,800
Plastics	$26,800	$15,900
Rubber	$27,400	$15,200
Water	$36,700	$37,300

This is a small occupational group with 1,660 workers in 1998, an increase from 1,540 workers in 1990. About 45% of these workers work in the plastics industry, 23% work in the chemical industry, 22% are employed in water and waste treatment plants, and 9% work in the rubber industry.

Because these employees work in factories, this tends to be a full-time occupation. There is little opportunity for self-employment or part-time work. Less than 4% of these workers are self-employed, and 8% work part time. In comparison, the all-occupation averages for self-employment and part-time work are 15% and 26%, respectively. About 60% of these workers work full time, full year.

The unemployment rate for this group is about the same as that for the overall workforce. Although this work does not tend to be seasonal, it does fluctuate somewhat with changes in economic conditions within the industries. Those employed by water utilities are affected by public policy.

These workers are found in a variety of industries associated with the products manufactured. The largest industrial employer is the plastics industry, which employs 34% of these workers. The second largest employer is the chemical industry, which employs 12% of this group. Water utilities, wholesale trade and the rubber industry also employ significant shares of this group.

This is an urban occupation. Over 70% of the workers live in Vancouver. All other regions have fewer workers than the average regional distribution of the workforce.

About 81% of these workers are men. The age distribution of these workers is close to the age distribution of the workforce as a whole. However, these workers tend to be slightly younger than the workforce overall. Their average age is 37, one year younger than the all-occupation average.

Employment Prospects

This is a small occupational group, made up of about 1,660 workers in B.C. in 1998. Projections from the Canadian Occupation Projection System (COPS) call for a growth rate of 1.3%, slower than the average for all occupations. This projection means that 490 positions will become available between 1998 and 2008. About 55% of these openings are expected to come from the need to replace workers who retire, with the remainder coming from growth in the number of new jobs.

There are a number of factors responsible for the low employment growth of this occupational group. Employment in the plastics and chemical manufacturing industries, which together employ roughly 45% of these workers, is growing more slowly than the average. The productivity of these workers will continue to increase due to the ongoing investment in machinery, equipment and computer-based technologies. Consequently fewer workers will be required to produce the same or greater amounts of output. However, with these advances in technology, the knowledge required of these workers is also increasing. Pressures from competition and consumers to meet higher quality standards will also increase the skill requirements for these workers. These factors will cause the variety and complexity of tasks performed by workers in this group to increase.

There are a number of different types of *machine operators* within this occupational group, including those who process plastics (these workers make up 45% of this group), those who work in chemical plants (24%), waste water plant operators (22%) and rubber processing machine operators (9%). Of the 510 openings that are expected to become available for this entire occupational group, those coming from each of these sub-groups will be roughly proportional to their relative sizes.

Workers in this field often learn about vacancies through newspaper advertisements. Word-of-mouth and direct contact with companies and manufacturers are also common methods of learning about job openings.

Employers are interested in workers with general skills that are transferable within the industry rather than those with specific training. On-the-job training is often provided because there are so many changes in technology used that it is difficult for colleges to remain current. As a result, workers have the opportunity to acquire training for more highly skilled jobs, as well as to advance to supervisory positions.

Additional Information

Communications, Energy and Paperworkers Union of Canada (CEP) http://www.cep.ca

Related Occupations

- labourers in processing, manufacturing and utilities (961)
- waterworks and gas maintenance workers (in 744 other installers, repairers and servicers)
- plastic products assemblers, finishers and inspectors (in 949 other assembly and related occupations)
- applied chemical technologists (in 221 technical occupations in physical sciences)
- petroleum, gas and chemical process operators (in 923 central control and process operators)

9

Machine Operators and Related Workers in Pulp and Paper Production and Wood Processing

NOC 943

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	12,440	13,120	14,650

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
1,530	2,240	3,770

Annual Growth 1998-2008 1.1%

Main Industries of Employment

Wood Manufacturing	67%
Pulp and Paper Manufacturing	17%
Logging and Forestry	6%

Employment by Region

Lower Mainland	31%
Vancouver Island	19%
Northern B.C.	28%
Okanagan/Kootenay	21%

Self-employment 2%

Nature of the Work

Workers in this occupational group operate different pieces of machinery and equipment from control rooms or equipment consoles to produce wood and paper products. This group also includes *wood processing inspectors*. These workers are employed in sawmills, pulp and paper companies, wood treatment plants, wafer board plants and other wood processing plants.

Main Duties

The duties of these workers vary, but they share some common responsibilities. They observe equipment, panel indicators and video monitors. They complete production reports, communicate with operators to make process adjustments and perform routine product inspections. They are also increasingly responsible for repairs and maintenance.

Sawmill machine operators operate, monitor and control automated equipment to saw, trim and plane rough lumber into dressed lumber of various sizes.

Wood processing machine operators operate processing machines to remove bark from logs, produce wood chips and preserve and treat wood. These operators produce wafer board, particle board, insulation board, plywood and similar wood products.

Pulp mill machine operators operate and monitor various types of processing machinery and equipment to produce pulp. They also collect processing samples and conduct titration tests, pH readings and other routine tests on pulp and solutions.

Papermaking and *finishing operators* monitor and operate various automated paper making machinery to produce, coat and finish paper. They also mount, position and thread paper rolls using a hoist.

Paper converting machine operators operate various machines that fabricate and assemble paper products such as paper bags, containers, boxes, envelopes and similar products.

Wood processing inspectors and *graders* inspect and grade lumber, shingles, veneer, wafer board and similar wood products. They identify defects, measure products, ensure conformance to company specifications and classify products according to industry standards.

©Stone/Vancouver

Example Titles

sawmill machine operators (9431):

- apprentice lumber manufacturing industry, benchperson
- apprentice lumber manufacturing industry, circular sawfiler
- apprentice lumber manufacturing industry, sawfitter
- apprentice planermill maintenance technician 1
- apprentice planermill maintenance technician 2
- circular saw operator
- edgerman/woman
- planer operator
- sawyer
- trimmerman/woman

pulp mill machine operators (9432):

- bleacher plant operator - pulp and paper
- field operator - pulp and paper
- refiner operator - pulp and paper

papermaking and finishing machine operators (9433):

- back tender
- beater operator - pulp and paper
- machine tender

other wood processing machine operators (9434):

- lumber kiln operator
- particle board line operator
- plywood panel assembler
- wood treater

paper converting machine operators (9435):

- box maker operator
- carton forming machine operator
- corrugator operator
- paper products machine operator

lumber and other wood processing inspectors and graders (9436):

- grader tallyman/woman, wood processing
- grader - wood processing
- lumber grader

Education and Training

For workers in this occupational group, graduation from high school is usually required, and several weeks of on-the-job training is provided.

Sawyers often begin their career as sawmill labourers and learn their skills through practical experience. Most companies do not require high school graduation, but as the industry becomes more technical, grade 12 is increasingly preferred. Most large companies give employees courses in grading and cutting logs. *Head sawyers* and *planermill operators* usually require several years of experience in other sawmill machine operating positions within the same company.

To become a *head-saw operator, edger operator, trimmer operator* or *lumber-sizer operator* usually requires completion of a Sawing and Wood Machining for Lumber course offered by the Canadian Mill Services Association. Two options are available for the course. One option focuses on Coast Western Red Cedar Lumber Grading, and the second focuses on Coast All Species Lumber Grading. These courses are recommended to anyone who wishes to pursue work in wood-related occupations. It usually takes two to four years of on-the-job training after this education before sawyers can work without supervision.

There are no formal requirements for entry into most wood processing machine occupations. Most companies provide on-the-job training under the supervision of an experienced worker. The length of training varies from two weeks to four months, depending on the complexity of the job and the worker's education and practical background. Grade 10 or equivalent is required, but grade 12 is preferred. These occupations are more automated and computerized than in the past, and more employers are asking for additional qualifications and training.

For *lumber kiln operators, particle board operators* and *waferboard operators*, some combination of industry and company courses and on-the-job training may be required. Previous experience as a labourer in wood processing may also be required.

Pulp mill machine operators require grade 12. Formal company training and several months of on-the-job training are provided. Previous experience as a pulp mill labourer within the same company is usually required.

Papermaking and *finishing machine* operators usually require grade 12. Most companies recruit new production workers with little or no experience. On-the-job training for one or more months is required for positions such as rewinder operator or paper coater. One to four years of related experience and on-the-job training is required for more complex occupations. For example, several years' experience in junior positions, such as helper, winder operator and backtender within a pulp mill, are required before being promoted to machine tender.

Lumber graders and *other wood processing inspectors* and *graders* usually require grade 10, with grade 12 preferred, and three to twelve months' previous work experience in a related occupation. Completion of the Canadian Mill Services Association course in Sawing and Wood Machining for lumber graders and a wood products manufacturing program are both recommended before applying to companies. BCIT offers a Wood Products Manufacturing program. Prerequisites for this program include grade 12, with English and mathematics 12 and one science 11.

In addition, BCIT, University College of the Cariboo, College of New Caledonia and North Island College all offer diplomas in wood products and wood processing technology designed to enhance knowledge of wood properties and their applications. As well, Selkirk College offers a university transfer program in wood products processing, which grants credits toward a Bachelor of Science degree in Wood Products Processing at the University of British Columbia (UBC). For those wanting to advance in this field, the UBC degree program teaches skills necessary to manage a wood products manufacturing facility.

A certificate in industrial first aid is highly recommended for all occupations in this group.

Good communications skills and analytical ability are important in these occupations. Sawyers need to be alert and able to concentrate and to have a good sense of balance. They need good hand-eye coordination, as well as physical stamina and strength. They often work under pressure, as they must process wood at a pace that allows a mill to make money. In order to operate and adjust wood-treating equipment, papermaking and finishing machine operators also need good spatial perception, to visualize the desired characteristics of end products and understand the functions and relationships of machine parts. They should be able to work inside while exposed to extreme heat from equipment such as kilns and steam-heated dryers. Inspectors and graders need good mathematics skills in order to make measurements and calculations quickly and accurately. These occupations have become more automated, so knowledge of automated and computerized systems is necessary. It is also very important to understand the production process and the interrelationships between the various jobs.

Working Conditions

These workers are employed in various processing plants where it can be noisy, dirty, and dusty. These settings can be dangerous places, as workers are exposed to different types of processing machinery. Avoiding injury becomes easier with experience, but there are many other preventive factors that are extremely important. Workers must be cautious and use proper safety measures. These include wearing hard hats, eye and hearing protection, safety clothing and boots.

Most people in these occupations work 40 hours per week, but overtime and weekend work may be required. The structure of a work week may vary from worker to worker. Some work 12-hour shifts with four days on, rotating with four days off. Some mills and processing plants operate on shifts during days, nights and weekends. In addition, collective agreement arrangements between employers and trade unions often include a union security provision. This provision requires union membership as a condition of employment.

The average estimated earnings for this group of workers were $39,700 in 1995, which is above the provincial average of $27,900. Workers employed full time, full year earned about $45,000. This figure is also above the provincial average of $39,400.

There are differences in full-time, full-year workers' salaries for each type of machinery operator. Pulp and paper machinery operators earned the most, at about $54,600 for full-time, full-year work. Wood processing machine operators earned $43,900. Paper converting machine operators earned $40,600. Sawmill machine operators earned $42,500. Graders and inspectors earned $43,800 for full-time, full-year work.

This is a very large occupational group. This group experienced an increase of 680 workers between 1990 and 1998, and further equipment and machinery upgrades are expected to increase employment levels in the future.

Self-employment is almost non-existent among those employed in this group because workers are employed in mills, plants and companies. By comparison, the rate of self-employment across all occupations in B.C. is 15%. There is a small proportion of part-time workers (5%), well below the provincial average (26%). Full-time, full-year workers make up more than half of this group.

The unemployment rate among this group of workers is lower than the provincial average as employment is affected by seasonality and economic conditions.

Most of the workers in this group are employed in wood manufacturing (67%). This includes the sawmilling sector as well as plywood, veneer and secondary manufacturing. The rest of this group are employed in pulp and paper production (17%) and by companies primarily engaged in logging (6%).

These workers are evenly spread throughout B.C.'s regions. They are located in the Lower Mainland (31%), Northern B.C. (28%), on Vancouver Island (19%) and in the Okanagan/Kootenay (21%). This is in contrast to B.C.'s overall employment distribution, which shows over half (57%) of the provincial workforce concentrated in the Lower Mainland.

Employment numbers show that this occupational group is dominated by men. There is a small proportion of women (7%), compared to their 46% share of the overall workforce. Most women are employed as sawmill machinery operators, other wood processing machinery operators, and graders and inspectors.

Workers under the age of 25 make up 9% of this occupational group, which is below the all-occupation average of 15%. This small proportion suggests that entry-level positions are not widely available for younger workers. It also reflects that there has been job loss and little new hiring in the past 10 years. In addition, these occupations are typically filled by those with experience in more junior positions in mills and processing plants.

Employment Prospects

This is a very large occupational group, made up of about 13,120 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment to grow more slowly than the average for all occupations. Since it is such a large occupational group, however, it is expected that 3,770 positions will become available from 1998 to 2008. Most of these openings (59%) will be from people retiring, with the remainder to come from new job growth.

There are a number of factors responsible for the low employment growth of this occupational group. Employment in the B.C. forest and forest manufacturing industry is expected to grow more slowly than the all-industry average from 1998 to 2008. Industry sources indicate that, due to several contributing factors, fewer but more highly skilled workers will be demanded in this industry. Among these factors are global consumer pressures for higher quality and more environmentally responsible forest products. A reduction in the available supply of wood, fiber and wood chips, along with advances and changes in technology, will further reduce the employment demand for workers in this industry. Global competition, increased U.S. import restrictions imposed by the U.S. softwood lumber agreement and changing product markets by Asian buyers of coastal B.C. wood also will have a negative impact on the employment of B.C. forestry workers. Most employment growth will occur in value-added manufacturing, which accounts for roughly half of all workers currently employed in the forestry industry. Overall, primary forestry workers and others working in labouring and material handling occupations are expected to experience either little change or a decline in employment from 1998 to 2008.

Technological improvements have led to higher production levels with fewer workers. The new improvements are labour-reducing and more efficient and demand multi-skilled workers who are increasingly required to recognize technical problems. Multi-skilling is an important part of a strong workforce. Multi-skilled workers have greater income security because they can find work more readily after layoffs or technological changes.

Decreased timber harvest levels will affect employment levels in mills and manufacturing plants. There is a relationship between the number of jobs and the size of the allowable annual cut (AAC). A reduction in the supply of timber because of changes in the AAC would be tied to a reduction in the demand for workers needed to process it. Mills and plants are likely to shut down temporarily to deal with any supply shortages resulting from reductions in the AAC.

General ups and downs in the economy may cause employment fluctuations on a year-to-year basis. Employment in these occupations depends on the demand for lumber, wood products, paper and newsprint. Much of this demand is from international customers. The construction industry drives the demand for wood, and general economic conditions drive the demand for pulp and paper. Since the construction industry is cyclical, employment levels associated with lumber also vary with its fluctuations. Although B.C. construction has not been strong, U.S. construction has been driving the demand for B.C. lumber.

A growing public interest in the environment is also affecting the demand for newsprint. The demand for new materials is being restricted by the growing amount of paper and newsprint that is being recycled. However, industry sources feel that although recycling has taken some pressure off the demand for "virgin fibres," demand is still relatively stable.

Workers may progress to supervisory positions with experience and training. Due to seniority clauses in the collective agreements within the wood and pulp and paper sectors, mobility between the processing sectors, or even between some plants, is limited.

Employers can be found in the telephone yellow pages listed under sawmills, pulp, plywood and veneers. However, people considering entry into this or any other forestry-related occupation should be aware of the challenges facing this industry. They are advised to contact those workers employed in their area of interest directly for current information since there are differences in prospects depending on the geographic area of the province.

Additional Information

Communications, Energy and Paperworkers Union of Canada (CEP) http://www.cep.ca

Ministry of Forests http://www.gov.bc.ca/for

Forest Renewal B.C. http://www.forestrenewal.bc.ca

Related Occupations

- labourers in processing, manufacturing and utilities (961)
- welders and machining, metalworking, woodworking and related machine operators (951)
- printing machine operators and related occupations (947)
- central control and process operators (923)
- primary production labourers (861)
- forest product technologist (in 221 technical occupations in physical sciences)
- log scaler (in 2223 forestry technologists and technicians)
- production technologist in sawmills (in 223 technical occupations in civil, mechanical and industrial engineering)

Machine Operators and Related Workers in Textile Processing

NOC 944

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	1,030	1,530	1,110

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
-420	60	-360

Annual Growth 1998-2008 -3.2%

Main Industries of Employment

Wholesale Trade	61%
Textiles Manufacturing	15%
Clothing Manufacturing	10%

Employment by Region

Lower Mainland	76%
Vancouver Island	13%
Northern B.C.	3%
Okanagan/Kootenay	8%

Self-employment 18%

Nature of the Work

This is a very small occupational group because the textile manufacturing industry in B.C. is very small. Most of Canada's textile industry is in Ontario and Quebec. This group is made up of people who operate and maintain machinery to prepare, dye and finish fabrics, wool, yarn and thread. *Textile inspectors*, *graders* and *samplers* are also included in this group. These workers are employed by textile and garment companies, or they may be self-employed.

Main Duties

Weavers, knitters and *those employed in other fabric-making occupations* operate machines to process yarn, wool or thread into woven and knitted products. They operate automatic multi-needle machines to embroider material or to sew layers of material to make products. They produce cloth, lace and knitted garments. This group also includes workers who reproduce patterns, draw in and tie warps, and set up looms. This group consists of about 420 people.

Textile dyeing and *finishing machine operators* operate machines to bleach, dye or finish textile products. These workers perform duties that give clothing added value. Examples include embroidering, stitching and dyeing clothing. Workers set up machines and ensure that products are up to standards. This group consists of about 320 people.

Textile inspectors, graders and *samplers* examine fabric or products to make sure that they are up to standards. They mark and repair minor defects and sort products by criteria. They also record information on products inspected. This group consists of about 140 people.

Textile fibre and *yarn preparation machine operators* operate machines to prepare textile fibres or to spin, wind or twist yarn or thread. They also check for broken yarns or product defects and investigate machine stoppages. This is an extremely small group in B.C. consisting of about 50 people.

Example Titles

machine operators (9441, 9443):

- embroidery machine operator
- knitting machine operator
- loom operator
- printing operator - textiles
- screen printing operator - textiles
- weaver

inspectors, graders and samplers (9444):

- inspector - textiles
- quality control inspector - textiles
- wool inspector

Education and Training

There are no specific educational requirements for *machine operators* and *workers in the textile industry.* Training is generally on the job and lasts from one to six months. Some industry-based training is provided as well. Some companies require experience working with machines. *Patternmakers* require one to two years of experience as a cutter followed by one year of on-the-job training. See the profile Machine Operators and Related Workers in Fabric, Fur and Leather Products Manufacturing (NOC 945) for more information on cutters.

Some individuals enter the pattern design and patternmaking fields after completing a two-year fashion design program, such as those offered by Kwantlen University College and the University College of the Fraser Valley.

For those who wish to advance in these industries, Capilano College offers a two-year, full-time diploma program in Textile Arts, which emphasizes weaving, surface design, textile history, design and drawing. This program provides a strong foundation in understanding the construction of textiles. Admission requires a portfolio and an interview.

Textile inspectors, graders and *samplers* may require graduation from high school, and on-the-job training is provided. Experience as a weaver, knitter or other fabric-making operator may be required for inspection of more valuable and complex products.

Workers in these occupations need good manual dexterity, an attention to detail and an ability to work swiftly for extended periods of time. Good communication skills and interest in the final product are also necessary. Basic computer skills, creativity and analytical skills are important.

Working Conditions

These workers often spend time on their feet moving between textile machines. They must be careful not to wear clothing or jewellery that could get caught in moving parts. Machine operators wear protective gloves when dyeing garments. Hours of work are on average 40 hours a week.

In 1995 workers in these occupations earned an estimated average of $16,400, which is below the provincial average of $27,900. Workers that were employed full time, full year earned $21,700 on average, which is below the provincial average of $39,400 for full-time, full-year work.

There are differences in the full-time, full-year salary for each specific occupation. Textile dyeing and finishing machine operators earned $21,900 a year. Weavers, knitters and those in other fabric-making occupations made $18,300. Textile inspectors, graders and samplers earned $28,100. Textile fibre and yarn preparation machine operators earned $29,300.

This is a small occupational group. In 1990, 1,030 people were employed, and by 1998 these workers numbered about 1,530.

Self-employment among these workers is at 18%, a little above the provincial average rate (15%). According to industry sources, this indicates that many of these workers are weavers, knitters and embroiderers who produce crafts and speciality clothing for retail markets. Self-employed workers are mostly home based.

The proportion of part-time workers (19%) in this occupational group is about half that of the B.C. workforce average (26%). The proportion of workers employed full time, full year (41%) is higher than the provincial average, while full time, part year (40%) is lower than the provincial average.

The unemployment rate for this group is lower than the provincial average. Seasonal work contributes to the low unemployment rate, because many workers produce for fairs and exhibitions that occur during fall.

These workers are employed mainly in the wholesale trade (61%). Others are employed in textile manufacturing (15%), which consists of textile dyeing, finishing, embroidering and printing operations. Some are employed in clothing manufacturing (10%).

Most of these workers are located in the Lower Mainland (76%), where the majority of manufacturers are located. Workers in this group are also located on Vancouver Island (13%), in the Okanagan/Kootenay (8%) and in Northern B.C. (3%). Workers in the latter three regions generally weave, knit, dye and finish garments for fairs and exhibitions. Many also have small businesses involved in printing, screening and stitching for speciality markets.

More than half of the workers in this occupational group are women, which is higher than the share for women in all occupations (46%). Most of the women employed in this group are weavers, knitters, textile inspectors and textile machine operators. Industry sources indicate that most of the men in this line of work are in textile dyeing and finishing.

Workers under the age of 35 make up 38% of the workforce in these occupations. Most of these younger workers are textile dyeing and finishing machine operators. Specifically, these workers dye, stitch and print designer clothing.

Employment Prospects

This is a small occupational group, made up of about 1,530 workers in B.C. in 1998. Projections from the Canadian Occupation Projection System (COPS) call for a decline in employment of 3.2% per year from 1998 through to 2008. This means that by 2008 employment for this occupational group will decline by 420 people. Only 60 openings are projected to become available, and all of these will be to replace workers who retire. Since there are so many jobs disappearing in this field, most of these openings will probably go to those who either are already in the field or have recently left. Due to low pay and strenuous work, many additional openings will become available due to a high rate of worker turnover.

There are a number of factors responsible for the low employment growth of this occupational group. Employment in the clothing and textile manufacturing industries, which together employ roughly 25% of these workers, is projected to decline. As the manufacturing part of these industries will be updating equipment and introducing other new labour-saving technologies, this decline will fall disproportionately on workers in this occupational group. Computer-integrated machinery and manufacturing processes will let operators monitor a number of machines at once. Because the industry is becoming highly automated, those with many technical skills will have better opportunities.

The textile and clothing manufacturing industries in B.C. are craft, specialty and design oriented, with very little work in high production manufacturing. Many of these workers are weavers, knitters and specialty designer clothing producers. These industries and their employment demands are sensitive to fluctuations in economic conditions and to changes in taste and fashion.

Economic conditions will also affect employment demand for this occupational group. If people face tighter budgets, they buy less clothing. Unless product niches are found to cater to speciality markets, sales and employment in this occupational group will fluctuate. Garments made in B.C. are distributed locally, but B.C. firms do produce some specialty garments that are also exported to the rest of Canada and the world. International trade agreements are expected to affect product competition and employment demand.

Inspectors are usually required to have some experience making the products they inspect. Progression to supervisory and textile machinery repair positions is possible with experience and training.

Workers in this field often learn about vacancies through newspaper advertisements. Word-of-mouth and direct contact with companies and manufacturers are also common methods of learning about job openings. Employers can be found in the yellow pages under various headings, such as dyers, embroidery, children's and infants wear, and manufacturers' agents and representatives.

Related Occupations

- sewing machine operators (in 945 machine operators and related workers in fabric and leather products manufacturing)
- tailors and dressmakers (in 734 upholsterers, tailors and related workers)
- machinery and transportation equipment mechanics (731)
- creative designers and craftspersons (524)

Machine Operators and Related Workers in Fabric and Leather Products Manufacturing

NOC 945

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	3,860	4,470	4,880

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
410	640	1,050

Annual Growth 1998-2008	0.9%
Main Industries of Employment	
Clothing Manufacturing	57%
Logging and Forestry	9%
Personal and Household Services	7%
Employment by Region	
Lower Mainland	84%
Vancouver Island	5%
Northern B.C.	2%
Okanagan/Kootenay	9%
Self-employment	11%

Nature of the Work

Workers in this occupational group work mainly in manufacturing settings, cutting, sewing and inspecting clothing and other fabric and leather goods. They are employed in clothing, footwear, textile products, leather products and other manufacturing establishments. (Although the national occupation category includes fur production, there are currently no specialized hide and pelt processing factory workers in B.C.)

Main Duties

Sewing machine operators operate sewing machines to sew fabric, fur, leather or synthetic materials to produce or repair garments and other articles. They must use single and double needle machines, sergers, buttonhole makers and other specialized equipment. They may work on a piece-work basis, completing a whole article at a time, or on a production basis, doing only one part of an item. (For example, a worker may sew all collars and then pass them on to another worker to attach.) Some may operate machines to piece together sections of leather for handbags, shoes, etc.

Cutters cut fabric or leather to make parts for garments, linens or leather products. Fabric cutters place patterns on top of layers of fabric and cut the fabric following patterns. They use electric or manual knives or cutters, or computerized cutting devices. Leather cutters select leather and cutting dies for leather goods, position the leather on the cutting machine and operate the machine to cut the leather. Some may cut the leather by hand. They need to be able to get the best use of a skin by positioning pattern pieces according to the grain of the skin and any flaws it may have.

Inspectors and *testers* in this group inspect and grade leather or garments and other manufactured fabric and leather products. They maintain quality control standards on finished products. These inspectors also inspect garments and similar products for defects, such as seam splits, puckers, missing buttons and colour variations. They check the size of garments by placing items over fit forms or by measuring them. They also perform finishing work, such as trimming excess material and loose threads and removing lint and spots.

The work of inspectors is changing as more efficient machines are introduced, which, for example, have thread-cutters built in. Often only a visual inspection is necessary, and machine operators do their own repairs. As a result, inspectors are taking on additional tasks such as tagging and bagging finished garments. They also keep track of the number and type of defects, and grade and sort finished products.

While most of these workers are in the manufacturing sector, about 30% work in retail and wholesale trade and personal services. They do similar work, but may work in a different setting, such as a retail store or repair shop.

Example Titles

machine operators (9451):

- lining stitcher
- sample maker
- sample sewer
- serging machine operator
- sewing machine operator
- shoe sewer

cutters (9452):
- clothing cutter
- computer cutter
- die cutter
- leather cutter
- sample cutter

inspectors (9454):
- garment inspector
- hide grader
- leather goods inspector
- quality controller

©Stone/Vancouver

Education and Training

Sewing machine operators need some secondary school education and some experience in operating a sewing machine. High school home economics or any courses dealing with fabrics or clothing are useful, as are courses in mathematics (to help with measurements). On-the-job training is provided and may take two months to a year, depending on the complexity of the work.

Cutters usually have some high school education and receive on-the-job training specific to the machines being used. *Sample cutters* generally have experience as fabric or leather cutters before being promoted.

Inspectors and *testers* are usually promoted from positions as sample cutters and have considerable work experience in the manufacture of the products under examination.

Generally, these people must be able to follow instructions and work quickly for long periods of time. Good eyesight, a strong back and manual dexterity are essential.

Working Conditions

Workers in these occupations work in factories and large workshops. Hours of work are usually a standard 35 to 40 hour work week. Some after-hours or weekend work may be required, or may be chosen by workers being paid on a piece-work basis. Shops are often noisy and dusty, and machine operators may spend long periods of time sitting in one position.

Working conditions for many workers in this occupational group are not good. They may work long hours in unpleasant workplaces for very low wages. However, competition for this work can be tight, since many immigrant women who haven't yet learned English see this as one of their few employment options. Despite the possibility of poor working conditions, these jobs do offer an income for new immigrants who may need time to learn English and become oriented to a new society before seeking other work. Good shops do exist, and workers who secure these jobs have brighter prospects. Usually the presence of a union signals a shop with higher employment standards. Some jobs are available with smaller "niche market" companies, and these may also provide better conditions.

Workers in this occupational group have earnings well below the B.C. workforce average according to 1995 salary figures. All workers, including those who worked part time or part year, earned an estimated average of $14,100, compared to the all-occupation average of $27,900. Workers employed full time for the full year averaged $18,600, less than half the provincial average of $39,400.

Hourly rates for union workers in the Lower Mainland ranged from $7 to $12 in 1995. Industry sources confirm that minimum wage is the usual entry-level pay rate and that the $12 an hour rate is the high end for well-qualified, skilled workers. Many workers work at a piece-work rate, which can result in higher pay for those who can work very quickly, but piece-work often pays less than hourly rates. Within this group, cutters generally earn more than sewers, and some inspectors can earn higher wages, depending on their employer and their responsibilities.

In 1998 there were 4,470 people in this group in B.C., up from 3,860 in 1990. Self-employment among this group is less common than average. Compared to 15% of the workforce overall, 11% in this group report being self-employed. There are fewer than average part-time workers in these occupations as well, with only about 19% of this group working part time (compared to a workforce average of 26%). These workers are slightly more likely to work full time, part year than full time, full year. The unemployment rate among garment workers is higher than the provincial average.

The clothing industry works on four fashion seasons, and layoffs commonly occur in the change from one season to the next. For example, after the production of spring clothing, it may take weeks to receive orders for summer clothing and to get in new fabrics.

About two-thirds of these workers are employed in manufacturing industries (clothing, textiles and leather). The rest are employed in retail and wholesale trade, and personal services (such as dry cleaning and repair services).

Most workers in this occupational group in B.C. work in the Lower Mainland, where the manufacturing companies are located. A full 84% work in the Lower Mainland region.

Of the remainder, 5% are employed on Vancouver Island, 9% are in the Okanagan/Kootenay region, and only 2% live in Northern B.C.

The large majority (88%) of these workers are women. Members of visible minority groups make up 74% of these workers. Because the work doesn't require workers to have strong English language skills, these jobs are often filled by workers new to Canada who are still learning English. The average age of workers in this group (41) is three years older than the B.C. all-occupation averages.

Employment Prospects

This is a medium-sized occupational group, made up of about 4,470 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment to grow more slowly than the average for all occupations. This projection means that 1,050 positions will become available from 1998 to 2008. About two-thirds of these openings will be to replace workers who retire, with the remainder coming from new jobs. Due to low pay and strenuous work, a high rate of worker turnover will create many additional openings.

There are a number of factors responsible for the low employment growth of this occupational group. Employment in the clothing and textile manufacturing industries, which together employ roughly 62% of these workers, is projected to decline. This decline is expected to fall disproportionately on workers in this occupational group. This is because most workers in this group work in mass production factories, and these industries will continue to update equipment and introduce other new labour-saving technologies. For example, computer-integrated machinery and manufacturing processes will let operators monitor a number of machines at once. Cutters in particular have been affected by increased automation, as new computerized machines do some of the work previously done by these workers. This increased productivity of cutters, however, may increase the employment demand for those sewing the pieces together. Because the industry is becoming highly automated, those with many technical skills will have better opportunities.

Globalization is also expected to continue to have a negative impact on employment for this occupational group by further opening B.C. markets to foreign producers. Inexpensive foreign clothing imports compete with clothing from the local industry, which has higher operating costs. Some of these effects have been reduced recently due to higher levels of Asian investment in the clothing industry in the Vancouver area. Although most of the clothing produced in B.C. is for local markets, B.C firms do produce some specialty garments that are also exported to the rest of Canada and the world.

Employment in this occupational group is sensitive to general economic conditions. If people in general face tighter budgets, they buy less clothing.

Employment demand will be strongest for highly skilled workers who can handle difficult fabrics and detailed designs. Although large-scale manufacturing may be losing ground, there is growth in niche-market companies that place higher value on quality and design. There are also opportunities for work in companies that can provide custom-made products in a short time. Workers who show attention to detail and quality standards will succeed with employers who produce high-quality goods. These emerging companies will probably employ fewer workers because of their lower production levels. However, because the skill requirements are higher for these workers, the jobs will probably provide better working conditions and wages than the standard in this occupational group.

These workers are usually hired through newspaper advertisements. In the Lower Mainland, these job ads are often placed in local foreign-language newspapers.

Inspectors are generally required to have some experience making the products they inspect. Machine operators and cutters may become inspectors with experience, though work as an inspector doesn't automatically mean an increase in wages. These workers may also progress to supervisory positions with experience, though advancement opportunities are limited. Experienced workers may also be able to transfer their skills to related work as tailors and seamstresses or upholsterers. These related jobs tend to pay more than the production jobs in this occupational group.

Related Occupations

- tailors and dressmakers (in 734 upholsterers, tailors and related workers)
- textile inspectors (in 944 machine operators and related workers in textile processing)

About two-thirds of these workers are employed in manufacturing industries (clothing, textiles and leather). The rest are employed in retail and wholesale trade, and personal services (such as dry cleaning and repair services).

Machine Operators and Related Workers in Food and Beverage Processing

NOC 946

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	5,550	5,610	5,970

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
360	940	1,300

Annual Growth 1998-2008 0.6%

Main Industries of Employment

Other Food Processing Industries	67%
Beverages Manufacturing	10%
Fish Products Manufacturing	10%

Employment by Region

Lower Mainland	67%
Vancouver Island	14%
Northern B.C.	10%
Okanagan/Kootenay	9%

Self-employment 4%

Nature of the Work

This group is made up of machine operators and related workers who operate multi-function control machinery and hand tools to prepare food and beverages. They also process and package food, beverages, meat, poultry and fish products. This group also includes testers and graders who make sure food and beverages are up to standards. They work in a range of processing plants and in production facilities, such as breweries and bakeries.

Main Duties

Process control and *machine operators* in food and beverage processing operate multi-function machinery through computer control panels to process and package products. They observe gauges, computer printouts and video monitors to verify specified processing conditions. They make adjustments when required, maintain a shift log of production and check products to ensure that they are up to standards. They are employed in fruit and vegetable processing plants, dairies, bakeries, sugar refineries, meat plants and breweries.

Industrial butchers and *poultry preparers* slaughter livestock and poultry and use devices and knives to cut meat into sections for processing and packaging. They smoke and cure meat, as well as make sausage. Trimmers remove skin, excess fat, bruises or other blemishes from carcasses or meat portions. They are employed in meat and poultry slaughtering and processing establishments.

Fish plant workers operate machines to clean, cut, cook, smoke and dehydrate fish products. They also fillet fish, remove scrap parts using knives, and remove meat for canning or further processing. They are employed in fish processing plants.

Testers and *graders* sample products at various stages of processing to examine ingredients and make sure that finished products are up to company standards. They also grade raw materials or finished products and advise supervisors of deficiencies. They are employed in fruit and vegetable processing plants, dairies, bakeries, sugar refineries, meat and fish plants and breweries.

Example Titles

food and beverage processing (9461):

- bottling machine operator
- canning machine operator
- control-room operator
- mixer operator

industrial butchers and meat cutters, poultry preparers and related workers (9462):

- industrial butcher
- meat trimmer
- poultry preparer

fish plant workers (9463):

- fish canning machine operator
- fish cleaner and cutter
- fish cutting machine operator
- shellfish processor

testers and graders (9465):

- product tester, food and beverage processing
- meat grader

Education and Training

Some of these workers are required to have grade 12. Experience as a labourer in food and beverage processing may be required for machine operators. Experience as a machine operator in food and beverage processing is usually required for process control operators.

There is no specific education required in order to work in a processing plant. However, grade 12 is usually preferred by employers. On-the-job training is provided to teach workers how to operate and maintain machinery. Computer skills are an asset, as much of the machinery is being computerized.

Feed mill workers usually require high school graduation and receive on-the-job training on the operation of machinery in various parts of the mill. Computer skills are a strong asset. Knowledge of general agriculture is also useful and can be obtained through short courses offered by the College of the Rockies, Northern Lights College and the University College of the Fraser Valley. See the profile General Farm Workers (NOC 8431) for more details. Feed companies may also offer their own training programs.

Meat cutters are required to complete a college program in meat cutting or an apprenticeship. See the profile Butchers and Meat Cutters, Retail and Wholesale (NOC 6251) for more details. *Poultry preparers* usually receive on-the-job training.

Fish plant workers need good eyesight and hand-eye coordination. Certification is required for cooking fish, and millwright certification is required for workers responsible for plant or machine maintenance. Basic mathematics and English skills are helpful. Basic computer skills are increasingly important for machine operation. Three to six months of on-the-job training is usually provided.

Testers and *graders* in food and beverage processing are usually promoted from industry machine operator or labourer positions. On-the-job training specific to the tasks involved is provided.

Generally, these workers need some mathematical ability, mechanical aptitude, manual dexterity and physical stamina. They need to be able to understand and follow written instructions. They should enjoy precise, routine work and have a high degree of awareness regarding safety, sanitation and hygiene procedures and practices. An ability to work independently and as a member of a team is important. Continual upgrading of skills is usually required.

Working Conditions

Most people employed in this group work 35 to 40 hours per week. Some processing plants operate on shifts, and workers may have to work nights, days or weekends.

Working environments vary among these processing workers. Process control and machine operators in food and beverage processing work in large processing plants. Fish and meat workers carry out their duties in large cutting rooms equipped with hand tools, power machines and conveyors.

Cutting rooms are refrigerated to prevent meat and fish from spoiling. Work areas must be clean and sanitary to avoid viral and bacterial infections. These workers have to be careful when working with knives, cleavers and power tools. The repetitive nature of this work may lead to cumulative trauma injuries, such as carpal tunnel syndrome. To reduce the incidence of this syndrome, employers have re-designed jobs and tools and increased the awareness of early warning signs.

The average estimated earnings for workers in this group were $20,800 in 1995. Those employed full time, full year earned an average of $31,400. The respective all-occupation averages in the province in 1995 were $27,900 and $39,400. Earnings vary depending on the type of product processed and the market prices for output. Industry sources report that industrial butchers at an entry level can earn from $1,200 to $2,000 per month. When they are qualified and experienced, they can earn $2,000 to $3,000 per month.

There are differences in the full-time, full-year salary for each specific type of worker in food and beverage processing. Testers and graders earn the highest at $40,400. Process control and machine operators in food and beverage processing earned $33,500, and industrial butchers and meat cutters earned $28,200.

This is a large occupational group in B.C. There has been an increase in workers employed in this group from 5,550 in 1990 up to 5,610 in 1998. Self-employment among these workers is almost non-existent because they are employed in processing plants. About 76% of workers in this occupational group work full time, while 37% work full time for the full year. The proportion of workers employed part time is 25%, which is about the same as the provincial average. However, industry sources feel that there is a trend toward more part-time work in fish processing plants. The unemployment rate for this group is almost double the provincial average. This suggests that competition for job vacancies is quite strong and reflects the seasonal nature of this work. Many foods, including fish and vegetables, are processed when they are in season. Industry sources report that the busiest season for industrial butchers tends to be from March to December.

Workers in this group are mainly employed in the food processing industry (67%). This industry is involved in processing meat, fruit, vegetable, dairy and bakery products. The second largest employer of this group is beverages manufacturing, which employs about 10% of these workers. The rest are employed in fish products manufacturing (10%) and the retail trade industry (3%).

Most of these workers are located in the Lower Mainland (67%) as this is where most of B.C.'s food and beverage processing plants are located and where the majority of B.C.'s population lives. In comparison, 57% of the overall B.C. workforce live in the Lower Mainland. Other workers in this group live on Vancouver Island (14%), in Northern B.C. (10%) and in the Okanagan/Kootenay region (9%).

Overall, there are approximately equal proportions of men and women in this group. Most women work as fish plant workers and in food and beverage processing. Though testers and graders are a small group, women make up 56% of this occupation.

The average age for people in this entire group is 39, just above the average age of 38 for all people in the B.C. workforce.

Employment Prospects

This is a large occupational group, made up of about 5,610 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects slower than average employment growth for this group. According to this projection, 1,300 positions will become available from 1998 to 2008. Nearly three-quarters of these openings will be to replace workers who retire. The remainder will come from growth in the number of new jobs. Additional opportunities for employment will result from turnover. This occupational group includes a number of different food and beverage products, and employment opportunities will vary for each specific field.

Employment for *food* and *beverage process control operators* is projected to grow more slowly than the average for all occupations from 1998 to 2008. This is expected to result in about 260 new openings from growth and 460 replacement positions. Industry sources explain that employment levels in this group are mainly affected by economic conditions, seasonal growing and climate conditions, and competition from import products. Work opportunities in this field are often for seasonal work. Summer is the busiest time for manufacturing and bottling beverages.

The combined employment growth of *industrial butchers, meat cutters, poultry preparers* and *related workers* is expected to be about as fast as the average for all occupations from 1998 to 2008. This is expected to result in about 300 new openings from growth and 310 replacement positions. New technology and the shift by consumers toward less meat consumption are both slowing the demand for industrial butchers and preparers. According to industry sources, the trend of meat cutters and processing plants to produce more retail-ready cuts for supermarkets is a potential source of growth for this sub-occupational group.

Employment for *fish plant workers* is projected to decline from 1998 to 2008 by about 210 positions. About 90 employment opportunities, however, are forecast to become available to replace workers who retire. The fish processing industry has been greatly affected by the decline in fish stock levels as well as by reductions in harvesting levels. Some smaller fish plants have closed because of these changes. Industry sources indicate that there is a trend toward processing fish at bigger canneries and closing down smaller ones. More cleaning and dressing duties are being performed on fishing vessels, and fish plants are becoming increasingly mechanized. All of these factors are contributing to a decline in demand for the labour-intensive work performed in fish plants.

Testers and *graders* are the smallest occupational group within this group of workers and are projected to grow more slowly than the all-occupation average. Since it is such a small group, only about 90 openings will become available from 1998 to 2008.

There is little mobility among the various types of process control operators within the food and beverage processing industry. For machine operators, there is some mobility among similar types of machinery. With experience and training, these workers may progress to supervisory positions.

The primary methods that employers use to recruit workers in these occupations are newspaper ads, word of mouth, direct contact from potential employees and advertisements at Human Resource Centres of Canada (formerly Canada Employment Centres).

Employers can be found using the index at the back of the yellow pages or by looking under breweries, fish packers, frozen foods and processors, meat packers and sugar refineries.

Additional Information

For *fish workers*

BCIT Fish Harvesting and Processing Technology Program

http://www.fishtech.bcit.bc.ca

Related Occupations

- labourers in processing, manufacturing and utilities (961)
- bakers (6252)
- butchers and meat cutters (6251)
- quality control technologist and technician (in 221 technical occupations in physical sciences)

Printing Machine Operators and Related Occupations

NOC 947

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	5,210	6,180	7,200

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
1,020	250	1,270

Annual Growth 1998-2008 1.5%

Main Industries of Employment

Printing and Publishing	61%
Retail Trade	16%
Air Transportation	5%

Employment by Region

Lower Mainland	67%
Vancouver Island	15%
Northern B.C.	6%
Okanagan/Kootenay	12%

Self-employment 11%

Nature of the Work

This group of workers sets up, operates and adjusts mechanized equipment and machinery to process text, photographs and film. They are employed by commercial printing companies, newspapers, magazines, publishing companies and printing services. Photographic and film processors are employed in film processing laboratories and retail photo finishing establishments.

Main Duties

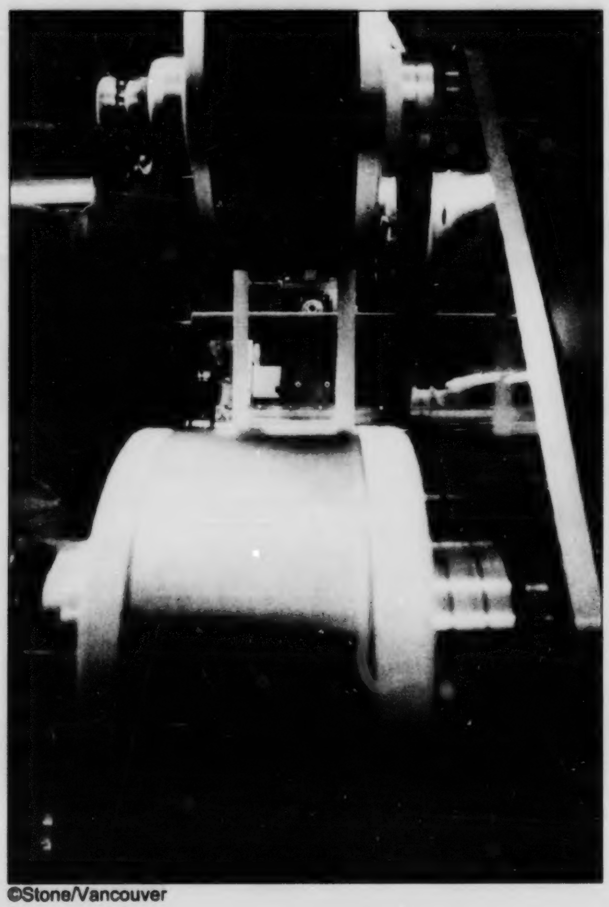
Printing machine operators set up and make adjustments to printing machines, such as filling ink or paint and loading paper stock. They input codes and key in programming data on the keyboards of computerized printers. They operate, monitor and adjust printing machines. Workers increasingly are maintaining and repairing machines as well.

Printing press operators set up and operate presses to print illustrations, designs and text on paper, plastic, sheet metal and other material. This group also includes workers who run laser printers, computerized copiers and other printing machines to print text, illustrations and designs on a wide variety of materials.

Camera, plate making and *pre-press operators* operate graphic arts cameras and scanners. They assemble film negatives and prepare printing plates for various types of printing presses. This group also includes graphic arts camera operators, film strippers, plate makers and pre-press technicians.

Binding machine operators set up and operate a variety of specialized equipment that cuts, folds, gathers, stitches and trims printed material. Finishing machine operators set up and operate equipment that die cuts, embosses, imprints, laminates and performs other finishing operations on printed material.

Photographic and *film processors* operate equipment to develop, print and enlarge photographs. They may also develop motion picture film. They measure and mix chemicals required for processing, and retouch photos or film to correct defects. They also splice film and mount film on reels and videocassettes.



©Stone/Vancouver

Example Titles

printing press and machine operators (9470):
- apprentice graphic arts, printer
- apprentice graphic arts, lithographic press operator (web or sheet feed)
- apprentice graphic arts, lithographic pressperson (web, sheet feed, rotary and gravure)
- apprentice graphic arts, stripper and assembler
- first pressman/woman
- offset press operator
- printing press operator
- screen print operator
- silk-screening machine operator

camera, platemaking and pre-press occupations (9472):
- apprentice graphic arts, electronic pre-press
- apprentice graphic arts, platemaker
- camera operator, graphic arts
- platemaker
- pre-press technician
- scanner operator
- screen maker
- studio image processing system operator

binding and finishing machine operators (9473):
- apprentice graphic arts, bookbinder
- book binding machinery operator
- gathering machine operator - printing
- laminating machine operator
- stitcher operator

photographic and film processors (9474):
- dark room technician
- film printing machine operator
- film processor
- photofinisher

Education and Training

Printing machine and *press operators* may require grade 12 and either the completion of a post secondary program in printing or an apprenticeship. On-the-job training is provided.

Camera, platemaking and *other pre-press occupations*, as well as binding and finishing machine operators, require grade 12 and either a college program in graphic arts technology or an apprenticeship program in printing and graphic arts, or a combination of on-the-job training and specialized college, industry or other courses.

Film printing machine operators in retail outlets receive on-the-job training. Progression is possible from automatic machine tenders to laboratory processing occupations.

Photographic and *film processors* in film processing laboratories may require completion of a college program or extensive related experience, although employers may hire high school graduates with mathematics and chemistry. Experience gained through processing film as a hobby can be helpful. These technicians usually receive a few weeks' training on the job.

Vancouver Community College offers a one-year Graphic Arts Printing Production program, which includes courses in areas such as typesetting, production planning, electronic pre-press, image assembly and platemaking, bindery, production planning and estimating, and sales coordinating. Admission requires grade 12, English 11 and a mathematics assessment. Graduates may look for entry-level work in the graphic arts industry or start an apprenticeship. See the profile Creative Designers and Craftspersons (NOC 524) for more information on applied arts programs.

Langara Community College offers a Professional Photo-Imaging Diploma program. This program contains courses in custom processing and custom print operation. Admission requires grade 12, with physics and mathematics 11, and submission of a portfolio. North Island College offers a certificate program in Professional Photography. The program is designed to teach the necessary skills to work in the photography industry. This program includes courses in film development, contrast printing and contrast control.

See the profile Photographers, Graphic Arts Technicians and Technical Occupations in Motion Pictures, Broadcasting and the Performing Arts (NOC 522) for additional information about photography programs.

Various apprenticeships are available in this area. Apprentices who begin their career in a small shop generally undertake a program that offers an overview of many processes and procedures, whereas those who start with a large company may immediately choose to specialize in an area such as preparation, composition, printing or binding. Most apprentices require at least a grade 10 education, with grade 12 preferred. More details can be obtained by contacting the Industry Training Apprenticeship Commission.

Continuing education departments at community colleges and universities offer courses and part-time programs in electronic typesetting and desktop publishing. These courses may be helpful in becoming computer literate and in maintaining employment in the printing industry.

People in these occupations generally require mechanical aptitude, manual dexterity, normal colour vision and analytical ability. Regular retraining is generally necessary, especially for press operators. This work appeals to those who enjoy working with their hands and who value creativity. Drafting skills, typing and computer skills, and creative interests are strong assets for those working in this field. Attention to detail is absolutely essential. Printing costs rise rapidly if a press has to be stopped or if work needs to be rerun due to error. People in this field must be able to meet deadlines. They must be able to stand for long periods of time. They require good communication skills, tact and discretion. An ability to adapt to new technology is necessary for success.

Working Conditions

These workers are employed in a wide variety of production settings. Printing, binding, finishing and pre-press machine operators work for commercial printing and colour graphics companies, newspapers, magazines and establishments that have in-house printing facilities. Photographic and film processors work in film processing laboratories and retail photofinishing establishments.

Operating printing machinery and equipment can be physically and mentally demanding. It may also be tedious at times. Operators often work under pressure to meet deadlines and in settings that are noisy. Workers in high volume printing environments often wear ear protection.

Working with many high-speed pieces of equipment can be hazardous. New computerized presses lessen the dangers because operators make most adjustments from a control panel. Many of those employed in this group work evening, night and overtime shifts.

The average estimated earnings for workers in this group were $23,800 in 1994, compared to the provincial all-occupation average of $27,900. Full-time, full-year workers earned an estimated average of $34,100. This earnings figure is similar to the provincial average ($39,400).

In 1996 industry reported that new workers employed full time earn $1,500 or more per month. An experienced, full-time worker earns between $1,600 and $4,100 per month.

Full-time, full-year earnings vary among these workers. Printing press and machine operators earned an estimated average of $29,900 in 1995. Camera, platemaking and other pre-press occupations earned an average of $55,100. Binding and finishing machine operators earned an average of $33,900. Photographic and film processors earned the least, with an average of $25,900 for full-time, full-year work.

This is a large occupational group. It grew slowly in the 1990s, from 5,210 in 1990 to 6,180 in 1998.

Self-employment among these workers (11%) is below the provincial all-occupation average of 15%. Most workers in this group work for commercial printing companies, newspapers, magazines, publishing companies and printing services. Photographic and film processors have a slightly higher proportion of self-employment than the other occupations in this group.

There is a high proportion of full-time work within this group. Overall, 75% work full time for the full year or part of the year. In general, part-time work (25%) is about the same as the provincial average of 26%.

The unemployment rate for this group is similar to the provincial average, reflecting that employment is fairly stable and that seasonal work is not a factor.

Workers in this occupational group are mainly employed in printing and publishing agencies (61%). Retail services (16%), air transportation (5%) and business services are other main industries that employ these workers.

Most workers are located in the Lower Mainland (67%), where most of B.C.'s workforce is located overall. However, this is a larger share than that region's workforce average of 57%. The remaining workers are employed on Vancouver Island (15%), Okanagan/Kootenay (12%) and Northern B.C. (6%). Photographic and film processors are more evenly distributed around B.C.

There is a moderate representation of women (47%) in this occupational group in B.C. About half of the women in this occupational group are photographic processors, and they make up 62% of these workers.

About one in five workers is under the age of 25, which is above the all-occupational average. This large proportion suggests that entry-level positions are available for younger workers in this occupational group. The biggest concentration of younger workers is in photographic and film processing, with 26% of the group made up of workers under the age of 25.

Employment Prospects

This is a large occupational group, made up of 6,180 workers in B.C. in 1998. The Canadian Occupation Projection System (COPS) calls for an annual growth rate of 1.5%, about as fast as the average for all occupations. A total of 1,270 openings are projected to become available from 1998 to 2008. Of these openings, 80% will come from the growth in employment.

While the COPS model projects that only 20% of employment openings will be due to retirements, industry sources expect that most of these openings will be to replace experienced workers who retire. In the 1950s through to the 1960s a large block of workers were hired. Many of these workers will retire by 2008, and opportunities will become available to replace these workers.

New employment openings will come from growth in the printing and publishing industry, which employs roughly 60% of these workers. Additional employment opportunities will become available in other industries, such as business services and retail trade, where it is possible to use desktop publishing and low-cost printers to do small print runs. Most quality brochures, pamphlets and newsletters are now produced this way.

Employment for *photographic* and *film processors* is projected to grow faster than the all-occupation average. A total of 470 openings are expected to become available for this group from 1998 to 2008, more than that for any other occupation within this group. Employment growth for this occupational group is fueled by a high demand for photographic services from a growing population and from tourists. Improvements in processing technology, however, are expected to reduce somewhat the employment impact of this high demand for services.

The increasing use of new labour-saving technologies, such as publishing software, could act to reduce the employment growth rate of this occupational group below the COPS forecasted rate. More efficient computerized printing presses and Internet use will continue to make printing and photographic processing less costly but will also reduce the need to produce printed information. For example, advertising, newspapers and magazines are increasingly being placed online. The Internet is able to provide access to up-to-date information and large documents with the click of a button, and users can print just what they want to.

Competition for positions in this field is expected to be keener than ever due to the impact of technology. Printing machine operators who have experience with new printing technologies have a distinct advantage over others seeking work in these fields.

With experience, it is possible to progress to supervisory positions in all of these printing and processing occupations. There are also progression opportunities among occupations within retail operations. For example, a front-end retail clerk may be promoted to the position of photo processor.

People considering entry into these and other printing occupations are advised to contact employers directly. Employers can be found in the yellow pages under printers, newspapers, magazines, publications and photography.

Additional Information

Industry Training and Apprenticeship Commission
http://www.itac.gov.bc.ca

Communications, Energy and Paperworkers Union of Canada (CEP) http://www.cep.ca

Related Occupations

printing machine operators:

- labourers in processing, manufacturing and utilities (961)
- machine operators and workers in textile processing (944)
- contractors and supervisors, trades (721)

camera, platemaking and other pre-press occupations:

- graphic designers and illustrating artists (in 524 creative designers and craftspersons)
- photographers and graphic arts technicians in motion pictures and broadcasting (522)
- typesetters and desktop publishing operators (in 142 office equipment operators)

binding and finishing machine operators:

- contractors and supervisors, trades (721)
- hand bookbinder (in 524 creative designers and craftspersons)

This work appeals to those who enjoy working with their hands and who value creativity. An ability to adapt to new technology is necessary for success.

Mechanical, Electrical and Electronics Assemblers

NOC 948

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	3,870	5,280	6,530

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
1,250	880	2,130

Annual Growth 1998-2008	2.1%
Main Industries of Employment	
Electrical and Electronic Products	44%
Motor Vehicles, Trailers and Parts Manufacturing	25%
Metal Fabrication Manufacturing	6%
Employment by Region	
Lower Mainland	64%
Vancouver Island	9%
Northern B.C.	2%
Okanagan/Kootenay	25%
Self-employment	5%

Nature of the Work

This group is made up of *assemblers*, *inspectors* and *testers* who produce and test various mechanical, electrical and electronic products. Workers who set up and prepare assembly lines for operation are also included in this group. They are employed by processing plants and manufacturers, such as those involved in assembling electronics, motor vehicles, heavy electrical machinery and transportation equipment.

Main Duties

The duties of these assemblers vary, but there are some similarities. They construct individual and prefabricated parts on assembly lines using automatic machines, equipment, hand and power tools. They set up process equipment, follow clean-room instructions and adjust machinery and equipment as required. They interpret engineering drawings, electrical diagrams and blueprints. They may also operate robotics and fixed automation equipment.

Aircraft assemblers assemble, fit and install prefabricated parts to manufacture aircraft and aircraft sections. *Motor vehicle assemblers* construct and install prefabricated motor vehicle parts and components to form subassemblies and finished motor vehicles. *Electronics assemblers* and *fabricators* assemble and fabricate electronic equipment, parts and components. In B.C. this is the largest occupation within this group. *Electrical appliance assemblers* assemble prefabricated parts to produce household, commercial and industrial appliances and equipment. *Industrial electrical motor and transformer assemblers* assemble, fit, and wire heavy-duty industrial equipment. *Mechanical assemblers* fabricate a variety of transportation products, such as trucks, buses, snowmobiles, tractors, car engines, transmissions, outboard motors, gear boxes, hydraulic pumps and sewing machines. *Machine operators* in *electrical apparatus manufacturing* operate machinery or equipment to fabricate complete products or parts for use in the assembly of electrical appliances and equipment and electrical apparatus, such as batteries, fuses and plugs.

Inspectors and *testers* are included in this group. The following are some of the common duties. They operate test equipment, compare results to specifications and set defective products aside for repair. They check in-process and completed production items for mechanical defects and troubleshoot production problems. They also collect, record and summarize inspection results.

Aircraft assembly inspectors inspect aircraft assemblies following engineering specifications. Motor vehicle inspectors and testers inspect and test parts, subassemblies and finished vehicles to ensure proper performance and conformity to quality standards. Electronics inspectors and testers inspect and test electronic and electromechanical assemblies, subassemblies, parts and components to make sure they conform to prescribed standards. Mechanical inspectors check subassemblies and finished products, such as transportation equipment, to ensure proper quality and product specifications.

©Stone/Vancouver

Example Titles

aircraft assemblers and inspectors (9481):
- airframe assembler
- bench fitter mechanic
- wing tank mechanic

motor vehicle assemblers (9482):
- motor vehicle assembler
- transmission installer
- inspector, car and truck assembly
- test driver

electronics assemblers and testers (9483):
- circuit board assembler
- surface mount machine operator
- through hole placement machine operators

- wiring and assembly operator
- inspector, electronics

electrical appliances, apparatus and equipment workers (9484):

- electrical appliances assembler
- lawnmower assembler

industrial electrical motors and transformers workers (9485):

- apprentice electrical rewind mechanic
- assembler and wirer, motors and generators
- control panel assembler
- fitter and assembler, AC and DC motors
- transformer inspector

mechanical assemblers and inspectors (9486):

- apprentice automotive radiator manufacturer and repairer
- apprentice truck body builder
- garden machinery assembler
- mechanical assembler
- transmission assembler

machine operators and electrical apparatus workers (9487):

- assembly machine setter - electrical equipment
- battery repairer, production line
- inspector, electrical control panel

Education and Training

Aircraft assemblers and *aircraft assembly inspectors* require grade 12 and completion of a post secondary program in aviation or aeronautical technology, with emphasis on aircraft manufacturing. Aircraft assemblers receive several months of on-the-job training as well as classroom training. Aircraft assembly inspectors require experience as an aircraft assembler.

The British Columbia Institute of Technology (BCIT) offers various aircraft mechanic and maintenance programs, such as the Aircraft Structures Certificate program, which prepares students for employment in the aircraft manufacture and repair industries. The Aircraft Mechanical Component Technician certificate provides basic component overhaul training and certification to work in this field. Completion of this program is usually followed by a three-year apprenticeship.

Northern Lights College offers an Aircraft Maintenance Engineering diploma that prepares graduates for employment as Aircraft Maintenance engineers in the Canadian Air Transportation Industry. Admission requires grade 12, with math 11 and physics 11. Mature students who do not meet these requirements but have related work experience can also apply.

Motor vehicle assemblers, inspectors and testers usually require secondary school graduation, and on-the-job training is provided.

Electronics assemblers, fabricators, inspectors and *testers* may require some secondary school education and post secondary courses in basic electronic theory, testing techniques and testing equipment. However, training may be offered by the employer. Electronics inspectors and testers may require experience as assemblers or component fabricators. Defective colour vision may limit employment opportunities.

Continuing education departments at several colleges and universities offer a variety of general courses in electronics. See the profile Electrical and Electronics Engineering Technologists and Technicians (NOC 2241) for more details about related programs.

Assemblers and *inspectors in the area of electrical appliance, apparatus and equipment manufacturing* require some secondary school education, and training is provided by the employer. Inspectors may require experience as an assembler within the same company. Some inspectors may require completion of an electronics college program. See the profile Electronic Service Technicians, Household and Business Equipment (NOC 2242) for more information.

Assemblers, fabricators and *inspectors of industrial electrical motors and transformers* usually have grade 12 and courses in electricity or electro-technology. Several years of on-the-job training is usually provided. Set-up persons, inspectors and leadhands in this group may require experience as assemblers, fitters or wirers within the same company.

Mechanical assemblers and *inspectors* require some secondary school and receive as much as two years of training on the job. Experience as a mechanical assembler may be required for inspectors in this group.

Machine operators and *inspectors* in the area of electrical apparatus manufacturing require some secondary school education and are trained on the job. Inspectors may require experience as an assembler within the same company.

Generally, these workers need good eyesight and colour vision, an attention to detail and an enjoyment of routine, precise work. Physical stamina may be necessary, and mechanical ability may be an asset.

Working Conditions

Assemblers work under various conditions depending on the type of manufacturing plant. Electronics assemblers may sit at tables in rooms that are clean and well lit, though increasingly they have to stand to operate machinery. Mechanical, industrial machinery and aircraft assemblers usually come in contact with oil and grease. Some workers also lift and fit heavy objects.

These workers spend most of their time performing repetitive duties. Some workers must wear uniforms, including hard hats and steel-toed boots, reflecting the safety concern in many work settings. These workers usually don't wear rings or watches because they can get caught on equipment or machinery. In addition, some precision assemblers may have to wear hair nets.

Most of these workers are employed 35 to 40 hours per week. In some operations, work shifts can be scheduled at any time, 24 hours a day, 7 days a week.

In 1995 the average estimated earnings for workers in this group were $22,900, compared to the all-occupation average of $27,900. Full-time, full-year workers earned about $31,400, which is below the provincial all-occupation average of $39,400.

According to industry sources in electronics, the average earnings in 1995 for electronic assemblers were about $23,000, which is slightly higher than the earnings average reported above.

This large occupational group has seen an increase in numbers employed, from 3,870 in 1990 up to 5,280 in 1998. The largest occupations within this group are electronics workers and mechanical workers.

Self-employment (5%) is not very common for these assemblers, fabricators and inspectors. By comparison, the rate of self-employment across all occupations in B.C. is 15%. Most workers in this group are employed full time (86%), and just below half of these workers are employed full time for the entire year. Part-time work (14%) is less common and is much lower than the provincial average of 26%.

The unemployment rate for this group is about the same as the provincial all-occupation average. This reflects that the industries that employ these workers are frequently affected by changes in the economy.

Workers in this group are mainly employed in electric and electronic product manufacturing (44%). They are also employed in motor vehicle parts manufacturing (25%) and in metal fabrication manufacturing (6%). The rest of these workers are distributed across a wide variety of industries in small proportions.

Most of these workers are located in the Lower Mainland (64%), where the majority of B.C. manufacturers are located. According to electronics industry sources, while most workers are in the Lower Mainland, growth is occurring on Vancouver Island. As well, one in four assembly workers are located in the Okanagan/Kootenay region (25%), which has seen significant growth in a range of manufacturing and processing plants.

There are fewer women (26%) in this occupational group than the average for all occupations in B.C. (46%). While low, this is still a higher share than in some of the other occupations that have been regarded as non-traditional for women. Women in this occupational group work mainly as electronics assemblers, fabricators, inspectors and testers.

There is a higher proportion of workers (28%) in the 25 to 34 age range than the workforce average (25%). In addition, there are more workers (28%) under the age of 25.

Employment Prospects

This is a large occupational group, made up of about 5,280 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment for this group to grow faster than the average for all occupations. According to this projection, 2,130 positions will become available from 1998 to 2008. The majority of these openings (59%) are expected to come from growth in the number of new jobs, with the remainder coming from the need to replace workers who retire. Additional opportunities for employment will result from turnover.

There are a number of factors driving employment growth for this occupational group. Employment in the electrical and electronic parts industry, which employs roughly 44% of these workers, is growing faster than the all-industry average. This is due to a growing consumer demand for computers and other electronic equipment. As well, the ongoing expansion of computer and electronic systems in all industries means that workers increasingly will be needed for precision assembly and repair.

Types of Assemblers and Fabricators	Number of Openings from 1998 to 2008
Aircraft	-20
Motor Vehicle	160
Electronics	990
Electrical	350
Industrial Electrical Motors	180
Mechanical	410
Machine Operators	60
Total	2130

Advanced technology is changing production methods and affecting employment levels. Some of these changes include robotics, computers, programmable motion control devices and various sensing technologies. Companies use automated equipment as they strive for more efficient or more accurate production methods. Workers must acquire new skills and knowledge in order to operate modern equipment and take on new duties as automation occurs.

Industry sources confirm that the amount of automation has increased dramatically in the past few years. This increase in automation has resulted in an increasing demand for these technical workers to maintain more efficient manufacturing processes and to manage increased production. Automation has changed the nature of the work from basic hand assembly to work for machine operators, programmers, and workers in maintenance, material handling, inspection and testing.

Relatively few precision assembly jobs have been eliminated by automation. There is still a need for human judgement and knowledge for work on products in difficult locations or on those with irregular parts. Many of these decisions and movements are currently beyond the capabilities of robots, and many may never be within their capabilities.

Assemblers and *assembly inspectors* may progress to supervisory positions with experience and additional training. It is possible for assemblers to progress to inspectors or testers and then to machine operators. Further, progression to machine programming and maintenance is also possible.

It should be noted also that many other occupational fields increasingly require workers with electronics and technical backgrounds. As a result, the job market is widening for people who possess the skills that are necessary for workers in this field.

Related Occupations

- labourers in processing, manufacturing and utilities (961)
- machinery and transportation equipment mechanics (731)
- electronic service technicians (2242)
- other mechanics (733)
- electrical/electronics engineering technologists and technicians (2241)

Other Assembly and Related Occupations

NOC 949

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	7,230	7,930	8,910

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
980	1,390	2,370

Annual Growth 1998-2008 1.2%

Main Industries of Employment

Railroad and Other Trans. Equipment	17%
Wood Manufacturing	16%
Retail Trade	13%

Employment by Region

Lower Mainland	62%
Vancouver Island	16%
Northern B.C.	5%
Okanagan/Kootenay	17%

Self-employment 13%

Nature of the Work

There are many manufacturing companies in B.C. that assemble products ranging from sailboats to watches. These companies also hire inspectors to ensure their products meet quality standards. Each of these companies requires workers unique to its process who can assemble the final products.

This category includes *boat assemblers*, *furniture assemblers*, *wood products assemblers*, *furniture finishers* and *refinishers*, *plastic products assemblers*, *painters* and *coaters* (manufacturing), *metal products finishers*, and *other assemblers* and *inspectors*.

Main Duties

Boat assemblers build wood, fibreglass and metal boats, such as sailboats, motorboats, canoes and cabin cruisers. *Furniture assemblers* put together individual pieces to form partial or complete items of furniture. *Wood products assemblers* make wood products and millwork, such as window sashes and doors. *Furniture finishers* finish new wood or metal furniture to specified colour and finish. *Furniture refinishers* refinish repaired, used or old furniture. *Plastic products assemblers* join plastic parts into finished products. *Painters* and *coaters* (manufacturing) apply paint, enamel, lacquer or other non-metallic protective and decorative coatings to surfaces of various production items. *Metal products finishers* deposit metallic substances on metal or other articles to provide decorative, protective or restorative coatings. *Other assemblers* and *inspectors* assemble and inspect a variety of products, such as jewellery, silverware, clocks and watches, musical instruments, sporting goods and toys.

Because of the diversity of these products, there is a wide diversity of processes used. In general, assemblers are responsible for using machines or hand tools to finalize the preparation of the parts for assembly. This includes cleaning, trimming and sanding to ensure a proper fit or surface for assembly or finishing. These workers set up equipment and prepare fasteners, glues, paints or metallic solutions for the final assembly or finishing. After the processing is done, they clean and maintain the equipment and work area. They inspect the final assembly to ensure that it meets quality standards. They may make minor adjustments to the product to meet those standards.

Example Titles

boat assemblers (9491):
- apprentice boatbuilder
- boat assembler
- boat inspector
- fibreglass boat assembler

furniture assemblers (9492):
- fixture assembler
- furniture assembler
- furniture inspector
- wood furniture assembler

other wood products assemblers (9493):
- millwork assembler
- prefabricated housing assembler
- wood products assembler
- wood products assembling inspector

furniture finishers and refinishers (9494):
- apprentice antique furniture restorer and finisher
- finishing machine operator
- furniture finisher
- furniture polisher
- furniture stripper
- wood finisher

plastic parts assemblers (9495):
- plastics fabricator
- plastic parts assembler
- plastic products inspector and tester
- skylight assembler

painters and coaters, manufacturing (9496):

- apprentice aircraft painter
- assembly painter
- coating machine operator
- industrial product painter
- paint machine operator
- production painter

plating and metal spraying operators (9497):

- apprentice electro-plater
- electroplater operator
- galvanizer
- metal products finisher
- metal spray operator

other assemblers and inspectors (9498):

- golf club assembler
- piano assembly inspector
- skate maker
- toy inspector

Education and Training

Boat assemblers and *inspectors* require some secondary school education, and on-the-job training is provided. Experience as a helper or a labourer within the same company may be required for boat assemblers. Experience as a boat assembler may be required for boat inspectors.

The level of skill required for boat assemblers and inspectors varies according to the occupational specialty and the type of marine craft being built or repaired. B.C. colleges and university colleges offer programs in welding, machining, steel fabrication, joinery and marine engineering, which may provide some basic preparation for entry. Other required skills can then be developed on the job.

Furniture and *fixture assemblers* and *inspectors* may require grade 12 and experience as a labourer with the same company. Other *wood products assemblers* and *inspectors* usually require experience as a labourer, and inspectors may require related assembly experience. *Furniture finishers* and *refinishers* require some secondary school education, and courses in furniture finishing or refinishing may be required. On-the-job training is provided in all cases.

Short courses on furniture finishing/refinishing are offered periodically through the continuing education departments of high schools and colleges as well as by local woodworking organizations.

Plastic products assemblers, finishers and *inspectors* are usually promoted from labourer positions within the same company. On-the-job training is provided.

Painters and *coaters* in the manufacturing of products usually require some secondary school education and are trained on the job. Some industrial painters, such as aircraft painters, require specialized training or college courses.

Plating, metal spraying and *related operators* require some high school education and experience in operating production machinery or equipment. Three to six months of training is usually provided on the job.

Other assemblers and *inspectors* in this area generally require some secondary school and experience as a manufacturing labourer for the same company. Training is provided once hired.

Generally, these workers should enjoy working with their hands and doing precise work. Manual dexterity and an eye for fitting pieces together accurately is needed. Basic skills in mathematics are required, and skills with hand and power tools may also be required. Skill in operating computerized equipment and mechanical aptitude may be assets.

Working Conditions

These are industrial jobs that require workers to be careful and pay attention to detail both for safety and for the quality of the product. These workers work in factories, and most of the jobs are full time. However, workers in this group face temporary layoffs when business is slow. When there are large orders, they may have to work shifts.

The work environment varies widely depending on the type of factory. Some are very clean, bright and well ventilated, while others are dusty and noisy. Some workers do a lot of standing, while others are seated at production benches.

The average estimated earnings for these workers are below the workforce average. In 1995 their average earnings were $21,400, compared to an average of $27,900 for the overall B.C. workforce. The average full-time, full-year earnings of those employed in this group were $28,800, compared to $39,400 for the B.C. workforce. The average yearly earnings range from $14,400 for other assemblers and inspectors to $28,300 for metal platers. Many of these occupations are considered entry-level and attract younger workers, so lower salaries are not surprising. As workers gain experience, they can advance to higher-paying positions.

According to the 1994 Student Outcomes Survey, the average starting salary for recent college graduates in these occupations was $1,480 per month, which is below the average of $1,730 per month for all graduates in the survey. Starting salaries for various individual positions within this group ranged from $910 per month to $2,080 per month.

This is a large occupational group with 7,930 workers. Painters and coaters are the most numerous of these workers, making up 21% of the occupational group. Wood products assemblers and furniture assemblers each make up 17% of the workers, boat assemblers account for 18%, plastic product assemblers account for 8%, furniture finishers account for 9%, and metal plating operators account for 2%. Miscellaneous assemblers make up the remaining 7% of the workers in the occupational group.

About 13% of these workers are self-employed. This is slightly below the workforce average of 15%. However, the opportunities for self-employment vary considerably by both region and occupation. For example, 67% of workers in the plating occupations in the Okanagan/Kootenay region are self-employed, and 28% of the boat assemblers on Vancouver Island are self-employed.

Less than 15% of this group work part time. The all-occupation rate for part-time employment in B.C. is 26%. In addition, 86% of these workers are employed full time either for the whole year or for part of the year.

The unemployment rate for this group is about the same as the workforce average. Although these workers may work in factories that are not faced with seasonal variations in workloads, they may be dependent upon economic conditions for the sales of their products. Rather than major manufacturing companies with continuous production, these employers tend to be "job shops" that rely on orders coming in before manufacturing the products. As a result, workers can face temporary layoffs between projects.

Because of the variety of industries involved, these jobs are widely distributed among different industries. The largest single employer is railroad and other transportation equipment, which employs 17% of these workers. The wood products industry employs another 16% of these workers. Retail trade employs 13%, and the fourth largest employer is the furniture manufacturing industry, which employs 11% of this group.

The regional distribution of these workers closely approximates the regional distribution of the workforce overall. There are slightly more of these positions than the average for Vancouver. As would be expected, boat assembly is more common in the Lower Mainland and on Vancouver Island, while wood and plastic product assembly is more prevalent in the Okanagan/Kootenay region.

This occupational group is dominated by men. Less than 17% of the workers are women. Because these tend to be entry-level occupations, the workers are younger than the workforce average. Over 48% of this group is under the age of 35. The average age for the group is 36, which is below the average age of 38 for the overall B.C. workforce.

Employment Prospects

This is a large occupational group, made up of about 7,930 workers in B.C. in 1998. Projections from the Canadian Occupation Projection System (COPS) call for a growth rate of 1.2%, slower than the average for all occupations. According to this projection, 2,370 positions will become available from 1998 to 2008. The majority of these openings (59%) are expected to come from the need to replace workers who retire. The remainder will come from growth in the number of new jobs. Due to low pay and strenuous work, a high rate of worker turnover will create many additional openings.

There are a number of factors responsible for the low employment growth of this occupational group. Employment in the retail trade and wood manufacturing industries, which together employ roughly 30% of these workers, is growing at a rate close to the all-industry average. According to industry sources, however, the productivity of these workers will continue to increase due to the ongoing investment in machinery, equipment and computer-based technologies. Consequently fewer workers will be required to produce the same or greater amounts of output. These advances in technology combined with pressures from competition and consumers to meet higher quality standards will also increase the knowledge required of these workers.

Although increased leisure time and early retirements are expected to continue to increase the demand for pleasure boats, labour saving technologies will prevent the demand for *boat assemblers* and *inspectors* from increasing by the same magnitude. Much of the job growth in assembly occupations, including boat assemblers, is likely to be in small businesses that are developing products for niche markets.

Due to the wide range of occupations in this group, projections for the period of 1998 to 2008 vary considerably from occupation to occupation. According to projections, 23% of the openings projected for this entire occupational group will be filled by *furniture* and *fixture assemblers* and *inspectors*. About an equal number of openings will become available for *other wood products assemblers* and *inspectors*. *Other assemblers* and *inspectors* will fill 14% of the openings, *furniture finishers* will fill 13%, and *boat assemblers* and *inspectors* will fill 12%. The remaining 16% of the openings will be divided among three occupational groups. Many of these openings will go to *plastic products assemblers* and *inspectors*, and a smaller share will go to *plating, metal spray* and *related occupations*. A very small number of openings will go to *painters* and *coaters, manufacturers*.

Government incentives have been put in place to encourage manufacturing and employment in value-added wood products industries. The policy intention is to increase the value of timber that is harvested in the province. Although governments encourage further processing of wood, these industries are often capital intensive and use high-technology machines rather than workers to compete in world markets. Employment for assemblers of wood products is still expected to grow faster than the average for all occupations.

Workers in these types of jobs can sometimes acquire additional skills in order to obtain more highly skilled jobs in their industry, or they can transfer their skills to other industries. With experience, workers are sometimes able to move to lead hand or supervisory positions.

Additional Information

Communications, Energy and Paperworkers Union of Canada (CEP) http://www.cep.ca

Related Occupations

- labourers in processing, manufacturing and utilities (961)
- woodworking machine operators (in 951 welders and machining, metalworking, woodworking and related machine operators)
- autobody repair painter (in 732 motor vehicle mechanics)
- upholsterers (in 734 upholsterers, tailors, shoe repairers, jewellers and related occupations)
- canoe craftsperson (in 524 creative designers and craftspersons)

- metal forming, shaping and erecting occupations (726)
- carpenters and cabinetmakers (727)
- painters and decorators (in 729 other construction workers)

Welders and Machining, Metalworking, Woodworking and Related Machine Operators

NOC 951

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	11,210	12,640	13,650

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
1,010	2,550	3,560

Annual Growth 1998-2008 0.8%

Main Industries of Employment

Metal Fabrication Manufacturing	23%
Other Service Industries	13%
Wood Manufacturing	11%

Employment by Region

Lower Mainland	52%
Vancouver Island	15%
Northern B.C.	13%
Okanagan/Kootenay	20%

Self-employment 10%

Nature of the Work

Welders and *metalworking, machining, woodworking*, and *forging operators* are occupations included in this group. This very large occupational group included about 12,640 workers in 1998. These workers operate a variety of hand tools and machines to fabricate, repair and bond either metal or wood to make products. They work in a range of industrial and manufacturing settings, from shipyards to furniture factories.

Main Duties

Duties vary, but the following are some of the common responsibilities. Workers read and interpret job orders or blueprints to determine machining operations. They check product specifications using precision measuring instruments and maintain equipment and replace parts when required. They also transport materials to work areas using cranes or hoists.

Welders and *soldering machine operators* use manual or semi-automatic welding equipment to fuse metal pieces together. They use flame-cutting, brazing and soldering equipment. Heat is applied to the pieces to be joined, melting and fusing them to form a permanent bond. They use metal shaping machines, such as brakes, shears and other metal straightening and bending machines. They generally plan work from drawings or by analysing damaged metal, using their knowledge of welding and metals.

Welders may specialize in certain types of welding, such as custom fabrication, ship building and repair, pressure vessel welding, pipeline construction welding, structural construction welding or machinery and equipment repair welding. Welder apprentices and journeyed workers are also included in this group.

Forging machine operators operate furnaces to heat and form metal to various specifications, such as shape, size, desired strength and hardness. They operate presses to shape metal by flattening, straightening, twisting, forming, splitting, cutting and punching the metal. They also remove metals from the furnace using tongs, overhead cranes and hoists. They are employed primarily in the fabricated metal products, machinery and transportation equipment industries.

Other metalworking machine operators set up and operate light or heavy machines to form metal stock into sheet and steel or other metal products. These machines include shears, power presses, saws, drills and CNC (computer numerical control) equipment. These workers also operate machines or equipment that weld, solder, bolt, screw or rivet metal parts together. They are employed in structural steel fabrication, heavy machinery manufacturing companies and the shipbuilding industry.

Metal products machine operators not elsewhere classified include a wide range of workers. They operate automatic or multi-purpose machines to produce a variety of metal parts and products, such as wires, nails, bolts and chains. They fit and assemble components using hand and power tools in addition to finishing products.

This group includes all machine operators not elsewhere classified who operate machines to cut, press, stamp, mould, treat, finish or otherwise fabricate components or products. Some products include jewellery, buttons, pencils, crayons, non-prescription lenses, brushes and other miscellaneous products. Machine operators load supplies into machines and monitor for proper operations. They also clean work stations and maintain machinery.

Woodworking machine operators set up, program and operate computerized or manual woodworking machines. These include saws, planers, drills and sanders. They make or repair wooden parts for furniture, fixtures and other wood products. They operate gluing machines to attach wood veneer to wood surfaces and operate pre-set special-purpose woodworking machines. They also clean and lubricate equipment and replace parts when needed. They are employed in furniture, fixture and other wood products manufacturing establishments.

Note that in data provided by Statistics Canada and reported here in *Work Futures*, NOC (National Occupational Classification) occupational unit groups Welders (NOC 7265) and Welding, Brazing and Soldering Machine Operators (NOC 9515) are combined to form Welders and Soldering Machine Operators (NOC 9510). This data has been used to describe welders and welding machine operators within this profile. For more information, see the *Technical Notes Appendix*.

Example Titles

welders and soldering machine operators (9510):

- electric arc welder
- gas-shielded arc welder
- pressure vessel welder
- production welder
- spot welder

forging machine operators (9512):

- bending machine operator
- forging press operator
- hot press operator
- manipulator operator

woodworking machine operators (9513):

- band saw operator - woodworking
- drill operator - woodworking
- lathe operator - woodworking
- planer operator - woodworking

metalworking machine operators (9514):

- disk flange operator
- punch press operator
- rolls operator
- vertical press operator

other metal products machine operators (9516):

- apprentice springmaker
- can forming machine operator
- metal cable maker operator
- wire screen maker

other products machine operators (9517):

- brush making machine operator
- jewellery annealer
- skate press operator
- sports ball moulder

©Stone/Vancouver

Education and Training

Welders learn their trade by apprenticing with a journeyed welder. Completion of grade 10 is recommended, but many employers prefer that apprentices have completed grade 12. Welders apprentice for three years, and this includes four periods of technical training. Welding training is available at most B.C. colleges and university colleges.

Apprentices who have completed approved entry-level training or a co-op program may be granted credit towards an apprenticeship. Upon completion of on-the-job and in-school training, apprentices must pass an interprovincial standards exam before receiving a Certificate of Apprenticeship and a Certificate of Qualification, with an interprovincial Red Seal endorsement.

A person who has documented evidence from employers of several years of work experience in the welding trade, but who has not apprenticed, may be eligible to write a challenge examination and receive trade certification. The local area office of the Industry Training and Apprenticeship Commission can provide more detailed information about these exams and welder apprenticeships.

Machine tool operators require some secondary education and some may require grade 12. College courses in machining may also be necessary. Several months of on-the-job training is provided. Senior positions in this group, such as set-up operator, require experience as a machine operator. Experienced machining tool operators may become machinists through apprenticeship training. The B.C. Institute of Technology (BCIT), College of New Caledonia and Selkirk College all offer machinist certificate programs. Students then can continue on to an apprenticeship. See the profile Machinists and Related Occupations (NOC 723) for details.

Forging machine operators usually require some secondary school as well as on-the-job training. Progression to blacksmith, die setting or supervisory positions is possible with experience. For more information about related apprenticeships see the profile Metal Forming, Shaping and Erecting Occupations (NOC 726).

Woodworking and *metalworking machine operators* and *welding, brazing* and *soldering machine operators*, as well as *other product machine operators*, usually require some secondary school education. On-the-job training is provided. Experience as a labourer (or machine operator helper) in the same company is often required. Both BCIT and Camosun College offer five-month sheet metal working certificate programs, which prepare students for entry-level positions within the industry.

Manual dexterity is important for workers in this trade. Good physical health and agility are necessary. Analytical ability and an understanding of computerized machinery is important. These workers must be able to read simple instructions and follow them precisely. They should enjoy routine tasks and working with others. Good communication skills are also important. A willingness to continue training and taking specialized training courses is usually necessary in order to be successful.

Working Conditions

Most people in these occupations work 40 hours per week. Some mills and processing plants operate on shifts during days, nights and weekends. Workers often belong to unions, and entry-level workers typically make do with limited working hours before working up to a regular schedule. These workers are often required to stand for prolonged periods, as well as lift and fit heavy objects.

These workers are employed in various processing plants and settings where it can be noisy, dirty and dusty. For example, welders are occasionally in contact with rust and grease and may be isolated for intervals while they work in booths constructed to contain sparks and glare. In some work settings workers are exposed to different types of machinery and toxic gases and fumes. In other settings working conditions are much better, and workers encounter few hazards or discomforts.

Avoiding injury becomes easier with experience, but there are many other preventive factors that are extremely important. Workers must be cautious and use proper safety measures. These include wearing hard hats, eye and hearing protection, safety clothing and boots.

The average estimated earnings for workers in this occupational group were $32,200 in 1995, which is higher than the provincial all-occupation average of $27,900. Full-time, full-year workers earned $39,000, which is lower than the provincial average of $39,400.

Industry sources report that entry-level workers in welding, machining and metalworking can earn a range of $23,400 to $36,000 per year. When qualified and experienced, they can earn $37,800 to $45,000 per year.

The earnings for different workers in this group also vary by occupation. Welders and soldering machine operators earned the most, at $41,800 for full-time, full-year work in 1995. Full-time, full-year forging machine operators earned $38,300 on average in 1995. Metal products machine operators who worked full time, full year earned $38,500 on average. Other products machine operators earned $29,400, metalworking machine operators earned $38,500, machining tool operators earned $36,500, and woodworking machine operators earned $27,400 on average, for full-time, full-year work in 1995.

This is a very large occupational group that increased in size from 11,210 in 1990 to 12,640 in 1998. The majority of workers in this overall group (71%) are welding and soldering machine operators. Of these machine operators, over two-thirds are welders. The two other big groups are woodworking machine operators (11%) and metalworking machine operators and machining tool operators (5%).

Self-employment among these workers is low (10%) because they are generally employed in mills, plants and companies. However, welders, soldering machine operators, other products machine operators and woodworking machine operators have a higher rate of self-employment than the other workers in this group. The range of self-employment rates for these particular occupations varies from 10% to 16%. By comparison, the rate of self-employment across all occupations in B.C. is 15%.

A large share (93%) of workers in this occupational group work full time, either for the full year or for part of the year. The proportion of people who work part time is 8%, which is much lower than the provincial average of 26%.

The unemployment rate for this group is about the same as the provincial average. Employment demand for workers is affected by economic market conditions in the industries that employ these workers. Seasonal work is generally not a factor.

These workers are employed in a range of industries. They work primarily in metal fabrication (23%), other service industries (13%), wood manufacturing (11%) and construction (8%). Note that metal fabrication includes fabricating boilers, metal tanks, structural metals and other metal products. Wood manufacturing includes sawmill and planing mill products, veneer and plywood, prefabricated wooden products, wafer board and particle board. Service industries include welding and other repair services.

Many of these workers are located in the Lower Mainland (52%). The rest of the workers in this group are located in the Okanagan/Kootenay region (20%), on Vancouver Island (15%) and in Northern B.C. (13%).

Women make up a very small proportion (4%) of this group. The B.C. all-occupation share of women workers is 46%. About one-quarter of the women who have found work in this occupational group are employed as woodworking machine operators. A few others have found work as metalworking machine operators, welders and soldering machine operators.

Compared to other occupations, the age distribution of this group is fairly average, although there are fewer workers (11%) under the age of 25 than the all-occupation average.

Employment Prospects

This is a very large occupational group, made up of about 12,640 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment for this group to grow more slowly than the average for all occupations. According to this projection, 3,560 positions will become available from 1998 to 2008. Almost three-quarters of these openings are expected to come from the need to replace workers who retire. The remainder will come from growth in the number of new jobs.

Investment and advances in labour saving technologies are slowing the demand for these workers. Growth in services dealing with metal-related industries is expected to be the source of most job growth. Other industries that are expected to contribute to job growth are the metal fabrication industries, primary metals manufacturing and construction.

Welding and *soldering machine operators* make up the largest occupation in this group, with almost 8,960 workers in 1998. Employment for these welding fields is projected to grow more slowly than the average for all occupations. This is mainly because the increasing utilization of computerized robotics in many factories will continue to have a negative impact on the employment of this group. Since it is such a large occupation, however, three out of every four openings that become available for this entire occupational group will be filled by this sub-group of workers. There will be some employment growth for welder-fitters with higher skill levels to perform specialized tasks that are not easily automated.

Roughly 640 *metalworking machine operators* were employed in B.C. in 1998. This occupation is also projected to grow more slowly than the average for all occupations from 1998 to 2008. A total of 140 openings are projected to become available for these workers during this period. Employment for these workers is mainly affected by activity in the metal fabrication, primary metals (non-ferrous and ferrous) and motor vehicle parts industries. New growth and activity in metal fabrication, shipbuilding and construction are employing the present supply of workers. Skilled workers are needed in steel fabrication, shipbuilding, boiler fabrication, pressure vessel construction and truck manufacturing.

Employment for *woodworking machine operators*, employing almost 1,420 workers in 1998, is also projected to grow more slowly than the average for all occupations from 1998 to 2008. Projections call for a total of 310 openings to become available for these workers. Companies are investing millions of dollars to upgrade and improve mills to meet market demands in both Europe and Japan. These developments mean that fewer but more highly skilled workers are required. These workers are also affected by the remanufacturing section of the wood products industry, which produces value-added wood products. Value-added products, such as semi-finished and finished wood products, including window, door and interior trim, high quality construction components and kiln-dried speciality products, are being exported.

Other products machine operator employment is also projected to grow more slowly than the average for all occupations from 1998 to 2008. Only about 100 job openings are projected to become available for these workers over this period. These workers fabricate a wide range of products from jewellery, buttons, pencils, crayons and brushes to nails, bolts and chains.

Employment for other metal and machining tool operators is also expected to grow more slowly than the all-occupation average. This is mainly because of the impact of labour saving technology. Since these are all very small occupations, they will have only a small number of openings. The *forging machine operators* field employed only about 50 workers in B.C. in 1998. Only about 10 job openings are projected to become available from 1998 to 2008 for this occupation. Forging machine operators may progress to blacksmith or die setting positions with experience. The *machining tool operators* occupation, with employment at about 630 in 1998, is expected to provide close to 210 openings in total. *Other metal products machine operators*, with employment at about 520 in 1998, is expected to have 130 total openings through to 2008.

Most workers in these fields will find themselves affected by automation or technological change and will need to retrain and acquire new skills and knowledge to be versatile. Those with the ability to work with advanced technological applications in these occupations will have better opportunities.

In all occupations within this group, workers may progress to supervisory positions with experience and training. Mobility is possible between plants in each manufacturing sector but there is little or no mobility between the different manufacturing sectors that employ these workers. For example, woodworking machine operators are able to move among common jobs in wood manufacturing.

Additional Information

Industry Training and Apprenticeship Commission
http://www.itac.gov.bc.ca

Related Occupations

- contractors and supervisors, trades (721)
- underwater welders (in 7382 commercial divers)
- machinists and related workers (723)
- metal forming, shaping and erecting occupations (726)
- carpenters and cabinet makers (727)

Investment and advances in labour saving technologies are slowing the demand for these workers. Growth in services dealing with metal-related industries is expected to be the source of most job growth.

Labourers in Processing, Manufacturing and Utilities

NOC 961

B.C. Employment Trends and Projected Demand

	1990	1998	2008
Number Employed	19,470	23,010	23,800

Estimated Openings 1998-2008

Growth (Net)	Attrition	Total
790	3,160	3,950

Annual Growth 1998-2008	0.3%

Main Industries of Employment

Wood Manufacturing	39%
Other Food Processing Industries	15%
Pulp and Paper Manufacturing	7%

Employment by Region

Lower Mainland	50%
Vancouver Island	13%
Northern B.C.	21%
Okanagan/Kootenay	17%

Self-employment	2%

Nature of the Work

Labourers in this group carry out a variety of duties to assist skilled equipment and machinery operators. They carry out routine cleaning and general labour activities in product processing, manufacturing and utilities industries. This is a very large occupational group, made up of 23,010 workers in 1998.

Main Duties

This wide range of labourers have a number of duties in common. They transport, sort and pile raw materials, finished products and scrap materials. They package material manually or using powered equipment. They prepare raw materials and feed and unload products using machinery and equipment. They perform general duties, such as basic construction, painting, cleaning and other manual tasks. They may also assist process and control workers to operate various machines and equipment and may carry out other processing activities.

Mineral and *metal processing labourers* perform material handling, clean-up, packaging and other basic activities related to mineral ore and metal processing. They are employed in processing plants for copper, lead and zinc refineries, steel mills, aluminium plants, cement processing plants and stone processing plants.

Metal fabrication labourers remove excess metal and unwanted materials from metal parts, castings and other metal products. They work in boiler fabrication, heavy machinery manufacturing plants, sheet metal fabrications shops and shipbuilding companies.

Chemical products processing and *utilities labourers* carry out a variety of material handling, cleaning and routine general labouring activities. They are employed by petroleum, natural gas processing, pipeline and chemical companies. They also work for electrical, water and waste treatment utilities.

Wood products processing labourers perform a variety of general labouring and routine wood processing activities and assist pulp mill and papermaking machine operators. They are employed by pulp and paper mills, sawmills, wood treatment plants, paper converting companies and other wood processing companies.

Rubber and *plastic products manufacturing labourers* assist machine operators, transport materials and perform similar tasks. They work for rubber and plastic products manufacturing companies.

Textile processing labourers carry out a variety of manual duties to assist in processing fibres into yarn or thread. They assist in weaving, knitting, bleaching, dyeing or finishing textile fabrics or other textile products. They are employed by textile companies.

Food and *beverage processing labourers* perform material handling, clean-up, packaging and other basic activities. They work in fruit and vegetable processing plants, dairies, flour mills, bakeries, sugar refineries, meat plants, breweries and other food and beverage processing plants.

Fish processing labourers do clean-up, packaging, material handling and other basic activities related to fish processing. They are employed in fish processing and packaging plants.

Other processing, manufacturing and *utilities labourers* not elsewhere classified handle material, clean up, package and carry out basic activities in processing, manufacturing and utilities. They are employed by companies that manufacture electrical and electronic products, clothing, footwear and furniture. They also work for printing and packaging companies.

Example Titles

mineral and metal processing labourers (9611):
- casting helper
- furnace helper
- kiln cleaner

metal fabrication labourers (9612):
- forge helper
- metalworking machine helper
- shipfitter helper

chemical products labourers (9613):
- chemical processing cleaner:
- helper - chemical processing
- labourer - gas utility

wood, pulp and paper labourers (9614):
- conveyor cleaner - pulp and paper
- lumber piler - wood processing
- plywood drier feeder

rubber and plastic products workers (9615):
- spreader operator helper, plastic manufacturing
- mould cleaner, rubber manufacturing

textile workers (9616):
- dyeing and finishing machine loader
- textile machine cleaner

food and beverage workers (9617):
- brewery worker
- dairy helper
- meat packager

fish processing workers (9618):
- cannery labourer
- fish plant labourer

other labourers (9619):
- apprentice graphic arts, lithographic press feeder
- electrical products labourer
- furniture packer
- packager, machine

Education and Training

Generally, *labourers* must have some secondary education, and some employers may require grade 12. The pulp and paper industry and other large employers require graduation from high school and on-the-job training is provided. Related experience is helpful.

Skills needed as a labourer often include good hand-eye coordination and good mathematics skills. A willingness to learn and an ability to read or listen to and then to implement instructions are important. Physical stamina and agility are often required of labourers, and they may be required to stand for long periods of time. An ability to work quickly, precisely and safely is important. Those who know how to use power tools and have mechanical ability may be able to find work more quickly. With the increasing use of computerized machinery, computer-literate workers have an advantage. Generally, a willingness to upgrade and adaptability and versatility are needed to improve chances of employment. Specialized training courses may be required in order to remain competitive.

Working Conditions

Working conditions for those employed in this occupational group vary depending on their specific duties. Most of these workers spend their time inside manufacturing and processing plants.

These workers can expect to do physical work. Some may work around harmful chemicals, unpleasant fumes, loud noise or dangerous machinery. Avoiding injury becomes easier with experience, but there are many other preventive measures that are extremely important. Workers must be cautious and use proper safety measures. These include wearing hard hats, eye and hearing protection, safety clothing and boots.

Labourers may work more than 40 hours a week, including weekend shifts. Their shifts are often eight hours, though they may be up to twelve hours long. Many labourers work evening or "graveyard" shifts. Collective agreement arrangements between employers and trade unions often include a union security provision. This provision requires union membership as a condition of employment.

The average estimated earnings for workers in this occupational group were $23,500 in 1995, which is lower than the provincial all-occupation average of $27,900. Full-time, full-year workers earned $34,900. This figure is also lower than the provincial average of $39,400.

This is a very large occupational group that has increased from 19,470 workers in 1990 up to 23,010 in 1998.

Self-employment is almost non-existent in this group because these workers assist in production and manufacturing. About 21% of workers work part time, a share that is lower than the provincial average of 26%.

The unemployment rate for this group is high. This high rate reflects a ready supply of workers and the seasonal nature of many of the industries that employ these workers. For example, jobs in the forest products manufacturing and fish processing industries are seasonal due to the length of the harvesting season.

Nearly half of the workers in this group are employed in forest products industries, with 39% in wood processing and 15% in food processing. The rest of these workers are in pulp and paper (7%), wholesale trade (7%) and metal fabrication manufacturing (5%).

Even though most of this work involves natural resources, many workers in this group are located in the Lower Mainland (50%). The rest are in Northern B.C. (21%) and in the Okanagan/Kootenay region (17%). The proportion of workers in Northern B.C. is higher than this region's share of the overall workforce total, which is 10%. Vancouver Island has 13% of these workers.

There are significantly fewer women in this work group (27%) than the B.C. average for all occupations (46%). However, this proportion is higher than in some other occupations regarded as non-traditional occupations for women. Most women in this occupational group are employed in food and beverage processing, in the wood products and fish products industries, and in other processing and manufacturing industries.

One in four workers in this group is under the age of 25, which is higher than the average for all occupations in B.C. Such a large proportion reflects that there are often entry-level positions available for younger workers and that this type of work requires little formal training. Many of these workers start as labourers, then move to more highly skilled work once they have gained experience and training.

Employment Prospects

This is a very large occupational group, made up of about 23,010 workers in B.C. in 1998. The Canadian Occupational Projection System (COPS) projects employment to grow more slowly than the average for all occupations. Despite the slow growth, there will still be a large number of openings due to the size of this occupational group and the need to replace retiring workers. According to COPS, 3,950 positions will become available from 1998 to 2008. About 80% of these openings will be to replace workers who retire. The remainder will come from growth in the number of new jobs. Due to low pay and strenuous work in many of these occupations, a high rate of worker turnover will create many additional openings.

There are a number of factors responsible for the low employment growth of this occupational group. Most of these workers work in manufacturing and processing plants that will continue to replace these low-skilled workers with updated equipment and other new labour saving technologies. Food processing, and especially fish processing, is expected to experience sizeable declines in employment levels as production is moved away from B.C. Employment in the B.C. forest manufacturing industry, which employs roughly 46% of these workers, is expected to grow more slowly than the all-industry average from 1998 to 2008. According to industry sources fewer but more highly skilled workers will be demanded in this industry due to several contributing factors. Among these factors are global consumer pressures for higher quality and more environmentally responsible forest products. A reduction in the available supply of wood, fiber and wood chips, along with advances and changes in technology, will further reduce the employment demand for workers in this industry. Global competition, increased U.S. import restrictions imposed by the U.S. softwood lumber agreement, and changing product markets by Asian buyers of coastal B.C. wood will also have a negative impact on the employment of B.C. forestry workers. Value-added manufacturing will be a source of some employment growth for these workers. Overall, *labours in processing and manufacturing occupations* are expected to experience either little change or a decline in employment from 1998 to 2008.

Due to the wide range of occupations in this group, projections for the period of 1998 to 2008 can vary considerably from occupation to occupation. Employment for *labourers in wood, pulp and paper processing* is not expected to grow. However, due to the size of this group and the need to replace workers who retire or otherwise leave the workforce, 37% of the projected job openings for this entire occupational group will be for these workers. Openings for *labourers in food, beverage and tobacco processing* will account for 31% of the total projected openings, while 16% will go to *labourers in processing, manufacturing and utilities. Labourers in mineral and metal processing* and *metal fabrication* combined will account for the remaining 16% of the total projected openings.

Employment of workers in many of these areas is affected by changes in the seasons. For example, fish processors will be in greater demand during seasons when the fishing is good. Employment is also affected by general economic cycles, which can cause employment fluctuations on a year-to-year basis.

Labouring and assistant positions provide entry into an industry and the opportunity to gain experience. These jobs may help workers find areas of interest, which can then aid them in the choice of further training. However, labourers in any processing plant are vulnerable to being displaced by labour-saving equipment. Workers must retrain and acquire new skills and knowledge in order to operate equipment and take on new duties. Multi-skilled workers are becoming very important in a technologically changing workplace. Employees must be able to perform a variety of tasks to be versatile workers.

For all of these labourers, progression to technical or more highly skilled operating positions is possible with additional training, education and experience. As well, there is mobility among jobs within each industry area. For example, a metal fabrication labourer can progress to the position of metalworking machine operator.

Additional Information

For *mineral and metal processing labourers* and *metal fabrication labourers*
Canadian Steel Trade and Employment Congress (CSTEC)
http://www.cstec.ca

For *chemical products labourers, lumber and pulp and paper labourers* and *rubber and plastic products workers*
Communications, Energy and Paperworkers Union of Canada (CEP) http://www.cep.ca

For *lumber and pulp and paper labourers*
Ministry of Forests http://www.gov.bc.ca/for

Forest Renewal B.C. http://www.forestrenewal.bc.ca

For *food and beverage workers* and *fish processing workers*
Ministry of Agriculture, Food and Fisheries
http://www.gov.bc.ca/agf

BCIT Fish Harvesting and Processing Technology Program
http://www.fishtech.bcit.bc.ca

Related Occupations

- trades helpers, construction labourers (76)
- primary production labourers (861)
- welders and machining, metalworking, woodworking and related machine operators (951)
- process control and machine operators in food and beverage processing (946)
- machine operators and related workers in textile processing (944)
- machine operators in lumber processing and pulp and paper processing (943)
- machine operators in mineral and metal production processing (941)
- central control and process operators (923)

Appendices and Indices

Technical Comments....590

Apprenticeship....597

A Guide to Public Post Secondary Education in B.C....600

Alphabetical Index of Occupations....621

Index of Occupations by National Occupational Classification....651

Index of Occupations by Skill Level....654

NOC Matrix....658

Feedback....661

TECHNICAL COMMENTS

This book has been presented in plain language so as to make it understandable to the non-technical reader. However, the following are a few areas where some further explanation may be useful or necessary.

DATA and METHODOLOGY

OCCUPATIONAL TITLES AND CODES used are from Human Resources Development Canada's (HRDC) *National Occupational Classification (NOC)*. The NOC presents a new structure for analysing and understanding the labour market and reflects occupational changes that have taken place over the past two decades.

The NOC forms the basis of the *Standard Occupational Classification (SOC) 1991* which is used by Statistics Canada to report data on occupations from the Census. Minor differences exist between the SOC 1991 and the NOC. The NOC is the occupational classification system normally used in employment counselling and placement.

Small differences between the two classifications occur where Human Resources Development Canada recognizes occupational distinctions that Statistics Canada could not implement due to the nature of Census responses. In all, only sixteen NOC unit groups have been collapsed to form eight groups in the SOC 1991. For example, NOC codes **4214 Early Childhood Educators and 6473 Early Childhood Educator Assistants** are collapsed to form SOC 1991 code **6470 Early Childhood Educators and Assistants**. Because Census data is used in the *Work Futures* publication, the code reported in this case would be the SOC 1991 code **6470 Early Childhood Educators and Assistants**. However, the NOC codes that make up the 1991 SOC code are clearly identified in the profiles and in the indices of this publication.

THE SELECTION OF OCCUPATIONS has been made with two objectives. First to provide information on occupations representing the *most employment in the province*, and second to provide more detailed information on occupations which are of *particular interest on the basis of the following*:

- whether the occupation had a higher-than-average employment growth rate compared to all other occupations in B.C.
- an informed choice on occupations by staff of HRDC and the Ministry of Advanced Education, Training and Technology (MAETT), in consultation with educators and a variety of industrial and professional sources.

With the exception of the few SOC 1991 codes used in this publication (see **OCCUPATIONAL TITLES AND CODES**), profiles in *Work Futures* are based on the National Occupational Classification (NOC). The NOC is a three-tiered hierarchical arrangement of occupational groups. It is comprised of:

- 26 major groups: the broadest level (2 digit codes)
- 139 minor groups: the intermediate level (3 digit codes)
- 522 unit groups: the detailed level (4 digit codes)

Occupational profiles in this publication are written at all three levels: three profiles at the major group level; 77 profiles at the minor group level and 103 profiles at the unit group level. This selection of 183 occupational groups encompasses approximately 98% of total employment in B.C. (See the NOC matrix on pages 658 to 659.)

The NOC is available on the Internet at http://www.worklogic.com:81/noc/home.html. It is also available for reference at libraries and Human Resource Centres of Canada. For those who wish to purchase a copy, there is an electronic version ($169.95) and as a two-volume set ($94.00) available from Nelson Canada, telephone 1-800-268-2222.

STATISTICAL DATA used in the tables and as a background to the descriptive text were gathered from the 1996 Census of Canada, and from COPS (Canadian Occupational Projection System). COPS was developed by Human Resources Development Canada in consultation with provincial governments as an information system that would provide historical, current and projected data on occupational needs and supply trends to 2008 on a national and provincial basis. While the COPS system provides a few different scenarios to test different economic conditions across Canada, the specific scenario used for this *Work Futures-British Columbia* publication is the "1999 B.C. Unique Reference Scenario", with variable coefficients enriched by the latest data from Statistics Canada's Labour Force Survey. For a more detailed information on COPS and projection of employment demand, please see the section on Understanding and Interpreting Occupational Employment Forecasts on page 593.

ESTIMATES OF EMPLOYMENT DEMAND AND GROWTH have been rounded to the nearest 10. This rounding process means that estimated employment in 1998, plus growth from 1998 to 2008, will not necessarily add to the employment estimate for 2008.

TOTAL NUMBER OF ESTIMATED OPENINGS to 2008 includes new employment opportunities due to economic growth (called ***net change***) as well as those opportunities which result from the need to replace existing personnel who leave the labour market because of retirement. This replacement need is called "attrition" within the COPS model.

The COPS estimates may be under-representing the number of openings. Because attrition captures only those who retire, it does not capture replacement needs from turnover, or because of existing personnel moving into other related positions, such as a management role. As a result there may be many additional openings in an occupation to replace these workers. For an example, please see Pharmacists, NOC 3131.

COMPARATIVE STATEMENTS are used extensively to place each occupation into a context of the entire labour market. These statements refer to employment growth, employment size, and unemployment levels based on 1996 Census results. A comparison of each of these measures is made against the provincial average. The accompanying schedules explain what is meant by these comparative statements. Please note that there are slight changes from previous editions.

Statistic	Year
Census	
Self-Employment	1995
Full-Time Full-Year Employment	1995
Full-Time Part-Year Employment	1995
Full-Time Total Employment	1995
Part-Time Full-Year Employment	1995
Part-Time Part-Year Employment	1995
Part-Time Total Employment	1995
% Employed Aged 15-24	1996
% Employed Aged 25-34	1996
% Employed Aged 35-44	1996
% Employed Aged 45-54	1996
% Employed Aged 55-64	1996
% Employed Aged 65+	1996
Emloyment by Gender	1995
Employed - Average Age	1996
Employed - by Level of Schooling	1996
Average Annual Earnings	1995
Full-time Full-year Earnings	1995
Employment by Region	1995
**Earnings are for B.C./Yukon*	
COPS	
Employed 1990	1990
Employed 1998	1998
Employed 2008 Forecast	2008-F
Employment by Industry	1998

Occupational Growth Rates Between 1998 and 2008

If the statement reads...	*Employment is projected to...*
Grow much faster than the average	Increase 2.4% or more annually
Grow faster than the average	Increase 1.9% to 2.3% annually
Grow about as fast as the average	Increase 1.4% to 1.8% annually
Little change or grow more slowly than the average	Increase 0% to 1.3% annually
Decline	Decrease (0.1%) or more annually

Occupational Size

If the statement reads...	*Estimated employment levels in 1998 total:*
A very large occupational group	10,000 up to 100,000
A large occupational group	5,000 to 9,999
A medium-sized occupational group	2,000 to 4,999
A small occupational group	1,000 to 1,999
A very small occupational group	999 or less

Existing supply of workers

Compares the 1996 Census unemployment rate in the given occupation with the average unemployment rate for all occupations, which was 9.6%.

If the statement reads...	*The 1996 Census unemployment rate was ...*
Low unemployment in 1996	Lower than 7%
About average unemployment in 1996	From 7% to 11%
High unemployment in 1996	Higher than 11%

THE AVERAGE ANNUAL EARNINGS reported in this publication is a measure of actual employment income, according to the 1996 Census of Canada. Earnings data are reported for **all workers** in an occupation as well as for **full-time, full-year workers**. The **all workers** category used in this publication includes part-time, full-time, part-year and full-year workers. The **full-time, full-year worker** category includes any person who considered their work to be full-time, and who worked for 49 to 52 weeks.

The average annual earnings reported for each of the occupational groups profiled is compared with the average earnings for all B.C./Yukon workers across all occupations. In 1996, the average annual earnings for all B.C./Yukon workers across all occupations were $27,900. For those working full time, full year, average earnings across all occupations were $39,400.

Where available, more specific earnings data such as entry-level wages are included in the profiles. These were provided by industry and professional associations. It is important to remember, however, that with any earnings data, actual earnings will vary based on number of years of experience, educational qualifications, size of company, and conditions of employment.

Additional earnings data appearing within the Working Conditions section of a number of the occupational profiles were taken from the 1999 B.C. *Colleges and Institutes Student Outcomes Survey*. This information provides salary levels within an occupation for recent B.C. college and institute graduates.

SELF-EMPLOYMENT information is obtained from the 1996 Census and includes individuals operating their own businesses, farms or professional practices (alone or in partnership), This group includes **employers**, who are self-employed workers with paid help and **independent workers**, who are self-employed workers without paid help. The 1996 Census shows that 15% of all B.C. workers were self-employed.

There are Census rules/definitions that affect the assignment of individuals to either the employee or *self-employed* category. For example, a person babysitting in his or her own home is considered self-employed. A person babysitting in another person's home is considered an employee. It is important to note that such rules/definitions can make significant differences in employee/self-employed counts. Readers attempting to compare results in this study with other surveys (particularly those outside Statistics Canada) or with counts from union or professional organizations should be aware that some differences may be attributable to these factors.

MAIN INDUSTRIES OF EMPLOYMENT used in the tables and as a background to the descriptive text have been identified in such a way as to provide the most appropriate context. They are industries as identified in the COPS model. These 67 COPS industries, either correspond directly to, or are groupings of the 1980 Standard Industrial Classification by Statistics Canada. The definitions of the COPS level of aggregation of Statistics Canada's *Standard Industrial Classification* is available from HRDC or MAETT.

GEOGRAPHIC DISTRIBUTION is based on the regional share of all work done in 1995, by occupation, as reported by the 1996 Census. The regions used correspond to Human Resources Development Canada service areas. These areas have been combined in a way that allows for a very close match with groupings of the Government of British Columbia Development Regions.

***Work Futures* Regions**	**B.C. Development Regions**
Lower Mainland	Lower Mainland/Southwest
Vancouver Island	Vancouver Island/Coast
Okanagan/Kootenay	Thompson-Okanagan Kootenay
Northern B.C.	Cariboo
	North Coast
	Nechako
	Northeast

Distribution of People who Worked in 1995		
British Columbia	100%	1,995,165.00
Lower Mainland	57%	1,144,660.00
Vancouver Island	18%	353,345.00
Okanagan/Kootenay	15%	306,775.00
Northern B.C.	10%	190,375.00
Capital Region District (part of Vancouver Island)	9%	172,015.00

OTHER 1996 CENSUS DATA reported in the descriptive text compare the average for the given occupation with the average for all occupations for the characteristics in the adjacent table.

B.C. , All Workers 1996 Census	
Part-time Employment	26%
Part-year (p-t/f-t) Employment	45%
Female Representation	46%
Age Distribution	
15 to 24	15%
25 to 44	25%
35 to 44	28%
45 to 54	21%
55 to 64	9%
65+	2%
Average Age	38yrs

LABOUR MARKETS are different from other markets because they involve the exchange of human services. As a result, a complex set of motivations, preferences and social and psychological factors enter into each individual's labour market decision making. This makes the analysis of labour market trends difficult. For example, people change their working hours or retirement age; people also have strong location preferences; personal concerns, career concerns and financial concerns all have different outcomes depending on the individual's preference. These patterns will also change throughout an individual's life. Many of these factors affect employment opportunities, although frequently they cannot be quantified. An attempt has been made to point out these aspects in the occupational profiles.

UNIVERSITIES, UNIVERSITY-COLLEGES, COLLEGES and INSTITUTES discussed in this publication are the public institutions in British Columbia. There are also private educational institutions in B.C. and educational institutions elsewhere in Canada which may offer similar programs.

RESEARCHERS and others who want further information in this area are advised to contact the research staff at one of the offices of the two co-publishers of this book:

Human Resources Development Canada
Strategic Services and External Relations
Subject: *Work Futures 2000 Edition*
15th Floor, 300 West Georgia Street
Vancouver, B.C. V6B 6G3
(604) 666-7444

Ministry of Advanced Education, Training and Technology
Youth and Labour Market Services Branch
Subject: *Work Futures 2000 Edition*
PO Box 9888 STN PROV GOVT
Victoria, B.C. V8W 9T6
1-888-664-2256

UNDERSTANDING AND INTERPRETING OCCUPATIONAL EMPLOYMENT FORECASTS

Projections of occupational growth are based on a number of factors, including economic and employment forecasts and market intelligence, most of which are not precisely known. First and foremost among these factors is the state of the B.C. economy and the potential growth of industries that make up the economic structure of the province. In turn, industry growth depends on a wide range of factors including changes in markets and in technology. Markets and competitiveness affect the demand and production of goods or services. This production of goods or services translates into the requirement to employ, or demand for, people in all the different occupational groups.

The COPS Model

In Canada the projection of employment demand at the occupational level is undertaken through the Canadian Occupational Projection System, COPS, operated by Human Resources Development Canada (HRDC) in close consultation with partners in provincial governments. In B.C., the Ministry of Advanced Education, Training and Technology (MAETT) is the provincial partner. COPS provides long-term projections of employment demand by industry for British Columbia based on Labour Force Survey historical data from Statistics Canada combined in a complex national and provincial forecasting model. COPS is the basis for the projections included in *Work Futures*, unless otherwise indicated.

The COPS model includes a variable occupational coefficient matrix which reflects changes over time in the mix of occupations within an industry group. These vary due to technological and organizational shifts for a known historical period with a projection for the future. Occupational projections are developed by multiplying industry employment forecasts by this variable coefficient matrix.

COPS Forecast for B.C.

The particular forecast scenario used in *Work Futures* is the "1999 B.C. Unique Reference Scenario" of the COPS Demand Model. This scenario provides an economic forecast of future levels and magnitudes of economic activity and changing technology. It suggests that the B.C. economy in real terms will grow on average at 2.6% per year between 1998 and 2008. This rate of economic growth falls within the medium- to higher-range of growth suggested by a consensus of economic forecasters at the time the 1999 Reference Scenario forecast was produced in January, 1999. This rate is then applied to forecasted levels of labour productivity (economic output per worker) to arrive at employment demand.

KEY FORECASTS

COPS 1999 B.C. Unique Reference Scenario
Average Annual Change 1998-2008

Economic Growth	2.6%
Labour Productivity Growth	1.0%
Employment Growth	1.6%

In the "1999 B.C. Unique Reference Scenario" forecast, labour productivity is forecast to grow on average at 1.0% per year between 1998 and 2008. Given these forecasted rates of output growth and labour productivity(y) growth, the COPS Demand Model projects overall employment demand for B.C. to grow on average at 1.6% per year between 1998 and 2008. This projection of employment demand growth is in the mid-rage of employment demand growth forecasts for B.C. by other economic forecasting agencies in Canada.

Beyond the COPS projection, the analyses of other trends and the inclusion of expert advice provides important subjective commentary on occupational projections. The employment prospects section of the Occupational Profiles in *Work Futures* often includes information and perspectives from such occupational experts including trade associations, professional societies, unions, industrial organizations and government agencies.

Employment Demand Forecasts

The projections for occupations in terms of growth and openings generated from the COPS Demand Model are projections of employment demand. It must be formally recognized that these projections of employment demand are not meant to, and do not, fully factor in the supply side of individual workers. That is, there is no assertion in the COPS model that workers with the particular skills-sets required will be available to fill those jobs projected by the model to be available. The COPS projections are simply projections of employment demand, and not forecasts of shortages or surpluses of workers for particular occupational groups.

It is recognized that the supply of workers has an impact on the ease of obtaining work and establishing a career in an occupation and that this is important to most readers of *Work Futures*. Within the Employment Prospects section of the occupational profiles there is some consideration and discussion given to factors which impact the relative prospects for employment. One of the factors which is often included here is a discussion of the current and future supply of workers.

It is recognized that many readers of *Work Futures* are also interested in understanding and anticipating the interaction between employment demand and supply. Such readers want to know where there appear to be existing or emerging shortages or surpluses of workers for particular occupational groups. For such readers, several points are offered for their consideration. At the broadest level, there often exist differences between education and training requirements from a supply perspective in preparing for an occupation and an employer's hiring decisions (demand) for actual employment openings. For those interested in examining the needs and requirements of the mix and types of occupational skills from a supply perspective against the occupational demand for employment, several important issues must be recognized.

The first issue to consider is that the classification of detailed occupational titles and their descriptions of activities and skills and education/training requirements can only be taken on an average or minimum basis. A single occupational employment position that exists in reality with a particular employer may differ in a number of ways from the occupational title with which it is described for the labour market as a whole in an occupational classification system. An occupational title for classification purposes must necessarily be broad enough to encompass the many individual positions that together make up a common occupation. While the general title and description of activities provides a relatively accurate portrayal of a particular individual occupation, the types and level of skills desired in practice will vary depending on the particular employer. Employers often can and do hire individuals with greater educational and training attainment for a particular occupational position, despite the fact that the scope of practice for the particular occupation may be lower. The education and training requirement is the average assigned to the occupation from an overall occupational classification system. In other instances the concept of an employer itself is much less relevant, as a number of occupations are characterized by a high degree of self-employment.

The second issue to consider relates to occupations for which there exist a less easily identifiable single corresponding level of education or training, and which draw upon individuals from a wide variety of post secondary education and training fields and disciplines. Insurance brokers is an occupation which employs persons with college diplomas in business administration, those with university degrees from various fields in commerce, social sciences, sciences and even humanities, and high school graduates who have employer/industry provided training and previous work experience in insurance offices. Classification necessities of assigning a single "on average" or "minimum" education/training requirement to a particular occupation, must be recognized and critically considered in applying such information to a particular occupational opening with a particular employer.

These realities illustrate that an exact one-to-one matching of labour supply to detailed occupational employment demand from the point of view of an individual undertaking career and educational planning with a view to future employment is not a simple or exact process. This is not to say that employment demand projections are not useful. Efforts to use and improve employment forecasting and projections are required, and they are useful as one of a number of factors for consideration by the individual in examining employment demand. Such projections should then also be considered against additional employment demand factors and the latest available information such as market intelligence, information from industry and occupational bodies, local employment conditions, and particular employer preferences. *Work Futures* has attempted to take into account and present a number of these types of employment demand factors in the occupational profiles.

Using Forecasts

It is important to note that in *Work Futures*, the employment demand projections from COPS are only one of a number of other factors which are used in examining and describing employment demand for particular occupational groups. To better understand employment demand overall, or even at the level of a very specific occupation, requires that we look at a wide variety of factors, data and information, and consider them together in developing analysis and interpretation.

In the Occupational Profiles, historical employment conditions in terms of full- and part-time employment, self-employment, industry concentration and earnings are examined and discussed. Information gathered through consultation with industry, labour and occupational groups on their views of employment demand is also detailed. This encompasses information included in the Occupational Profiles on the views of these groups concerning their validation of and/or the differences they have with the employment demand projections generated from the COPS projections. Information on all these factors together are presented in the Occupational Profiles in *Work Futures*. In cases where the views of industry and occupational groups on employment demand differ from those generated by the COPS model, this has been noted.

The labour market is very dynamic and there are many possible factors which must be considered when interpreting projections of employment demand, including unpredictable changes in the future. The position taken in *Work Futures* is a recognition that numerical projections from the COPS Demand model alone are but one factor to consider in investigating occupational employment demand. No single source or area of information is dominant in the occupational profiles in *Work Futures*, nor should one source be solely or primarily relied upon in interpreting employment demand. Rather, various sources and factors have been considered and applied together in addressing issues of changing employment demand.

APPRENTICESHIP

Apprenticeship is a training program which is designed to teach the knowledge and skills required in a trade or occupation. In most cases, an apprenticeship consists of paid, structured on-the-job training complimented by in-school technical education. The process of becoming enrolled as a formal apprentice is called indentureship.

To become indentured, an individual must be working in an apprenticeable trade and be registered with the Industry, Training and Apprenticeship Commission (ITAC). The individual, their employer and ITAC commit to a partnership that ensures the apprentice will receive valuable academic and workplace training in their chosen trade.

After successfully completing the requirements of an apprenticeship program, the apprentice is awarded a Completion of Apprenticeship Certificate (C of A). In those trades which also have available an Interprovincial Red Seal endorsement, apprentices must pass the examination in order to complete their apprenticeship. Interprovincial certification is also available to non-apprentices who write for a British Columbia Certificate of Qualification (C of Q or TQ).

Once an Interprovincial Red Seal has been issued, the holders are generally exempt from having to write any further examinations if they move to another province. However, not all provinces participate in all of the red seal trades and it may be necessary to check with the apprenticeship authorities in the intended location to determine their specific requirements. Employment and mobility prospects are generally better for individuals who have an Interprovincial Red Seal endorsement on their journeyperson certificate.

Frequently-Asked Questions Relative to Apprenticeship Training

Q. How do I get employment as an apprentice?
A. A person must be employed in the trade before the indentureship can begin. Gaining employment is the responsibility of the prospective apprentice.

Q. What wages are apprentices paid?
A. Once indentured, and apprentice can expect to earn 50% of what the employer pays his Journeyperson with yearly incremental increases over the duration of the apprenticeship term. Unionized employees who are apprentices may receive different amounts according to guidelines outlined within their collective agreement.

Q. Why should I be registered as an apprentice?
A. Apprentices are registered to ensure that all rules governing apprenticeship apply, for example: workplace safety considerations, appropriate training and supervision under qualified Journeypeople and adherence to the applicable wage scales.

Q. What are the academic requirements for an apprentice?
A. Academic prerequisites vary by occupation. Generally, grade 11 math, science and English are cited as the minimal academic entrance requirements. More and more industry groups are insisting on grade 12 level courses.

Q. Can any employer hire me as an apprentice?
A. No. The ITAC apprenticeship counselor assesses the employer to determine if the proper on-the-job training can be done.

Q. Can I receive credit for my apprenticeship training based on previous work experience in the trade?
A. Yes. Provided it is documented and the new employer agrees that your work performance is at the appropriate level.

Q. Can I change employers while I am an indentured apprentice?
A. Yes. The apprentice must notify their apprenticeship counselor that there has been a change in employers and formal transfer papers must be completed.

Q. Do I have to leave my place of work to attend technical training sessions at a college or trade school?
A. Yes. Apprentices are released by their employers to attend industry-approved technical training at a college, institute or trade school for a period ranging from four to ten weeks per year.

Q. Can I get an apprenticeship by taking a College course?
A. You must be working in order to be an apprentice. Colleges offer various trades training programs which, if approved by ITAC, will give you credit for your first level of in-school training. The employer may opt to give you up to six months time credit if your work performed warrants it.

Q. Where can I get more information?
A. From your regional ITAC apprenticeship office.

Apprenticeship in British Columbia

The apprenticeship training system in British Columbia, is a workplace-based training system. Over two hundred trades or occupations have been designated under the Industry Training and Apprenticeship Act.

Most occupations have an in-school technical training component, usually about six weeks a year. Some trades may require as much as ten weeks. This component provides the theory that supports the practical training back on the job. The on-the-job component can run anywhere from one year to five years, with most apprenticeships being four years in length.

The process commences when an individual approaches an employer and requests training as an apprentice. Once the employer agrees, either the employer or the employee will contact their local ITAC office. An ITAC apprenticeship counsellor will assess the employer's ability to train in the specific trade. The counsellor will want to determine if the employer has a Journeyperson to do on-the-job training and ensure that the employer can provide training in a sufficient scope of the trade, rather than specializing in only one or two areas. Once it has been determined that the employer can provide the training, a training agreement is drawn up. Both the employee and the employer sign this agreement.

In order to graduate from apprentice to Journeyperson status, the apprentice must write and pass an interprovincial examination... This certification is also respected throughout the world.

The employer agrees to pay the appropriate wage rate, to train the apprentice on the job, to ensure that they are exposed to the full scope of the trade and to allow the apprentice time off the job to attend the in-school training. The employee agrees to be proactive about learning on the job and to attend the assigned in-school training classes. In order to complete the apprenticeship, the apprentice must pass all the in-school training and be signed off as competent by the employer.

The agreement is a training agreement only and not an employment agreement. If the apprentice is laid off, the agreement can be transferred to a new employer. The apprentice will get credit for all levels of successfully completed in-school training. As this is a competency-based training program, the new employer must agree that the apprentice is operating at the appropriate level of competency for the on-the-job time to be credited.

Many of the apprenticeable trades are those in which union membership is common. In these cases, the employer and the union have partnered in setting up a Joint Training Board. Any prospective apprentice who is interested may apply directly to the Joint Board. The Joint Board co-ordinator would then contact the local ITAC apprenticeship counsellor to start the registration process. Most trades and occupations require applicants to have completed grade 12. Most of the trades have developed an entrance assessment tool, which helps evaluate potential apprentices and identifies academic areas which will need to be improved before attending the first level of in-school training. Many of the trades require an in-depth knowledge of math and science as well as technical literacy.

Many inexperienced applicants look for work in companies that deal with trades, as a helper or labourer. Then, after a period of time, they move into an apprenticeship either in that company or with another employer. Some post secondary institutions offer entry-level trades programs (ELTT) which, if approved by ITAC, will give credit for the first level of in-school apprenticeship training. Upon completion of an ELTT program, the prospective apprentice will still need to find an employer in that trade in order to be registered as an apprentice. The employer may opt to give up to six months time credit in recognition of completion of the program.

To work in many of the trades, the employee must either be a qualified Journeyperson or a registered apprentice. These 'compulsory' trades are: Plumbing Sprinklefitting, Refrigeration, Sheet Metal, Roofing, Steamfitting/ Pipefitting, Electrical Work, Power line Technician, Automotive Service Technician, Auto Collision Repair and Auto Paint and Refinishing.

Many of the trades are recognized under the Red Seal Program. In order to graduate from apprentice to Journeyperson status, the apprentice must write and pass an interprovincial examination. This provides the new Journeyperson with mobility across Canada and recognition as a fully qualified tradesperson. This certification is also respected throughout the world and many overseas assignments are available to graduates from the B.C. apprenticeship system.

To help decide which trade may be of interest to you, it is recommended to visit a few different work sites and speak with a Tradesperson or employer. Further information is also available from your local ITAC apprenticeship office.

INDUSTRY TRAINING AND APPRENTICESHIP COMMISSION
Field Offices

Apprenticeship training counsellors, located in Industry Training and Apprenticeship Commission offices across British Columbia, work with employers and future apprentices to formalize an indentureship agreement. The following is a list of regional offices. Further information on apprenticeship training may be obtained by contacting the office directly or on the Internet at **http://www.itac.bc.ca**

LOWER MAINLAND REGION

BURNABY
1103-4720 Kingsway, Metro Tower II
V5H 4N2
Phone: (604) 775-2860
Fax: (604) 775-0768

VANCOUVER
400-1001 West Broadway
V6H 4B1
Phone: (604) 775-1251
Fax: (604) 660-6296

VANCOUVER ISLAND REGION

COURTENAY
3rd Fl, 910 Fitzgerald Ave
V9N 2R5
Phone: (250) 334-1424
Fax: (250) 334-1449

NANAIMO
1st Fl., 155 Skinner St
V9R 5E8
Phone: (250) 741-5820
Fax: (250) 741-5818

VICTORIA
6-40 Cadillac Ave
PO Box 9157 Stn Prov Govt
V8W 9H2
Phone: (250) 952-5180
Fax: (250) 952-5042

INTERIOR REGION

CRANBROOK
203-100 Cranbrook St N
V1C 3P9
Phone: (250) 426-1281
Fax: (250) 426-1292

KAMLOOPS
441D Columbia St
V2C 2T3
Phone: (250) 371-3920
Fax: (250) 828-4973

KELOWNA
301-1726 Dolphin Ave
V1Y 9R9
Phone: (250) 717-2041
Fax: (250) 717-2038

NELSON
1st Fl., 310 Ward Street
V1L 5S4
Phone: (250) 354-6867
Fax: (250) 354-6883

FRASER VALLEY REGION

ABBOTSFORD
200-32463 Simon Ave
V2T 5E3
Phone: (604) 852-5922
Fax: (604) 864-6707

COQUITLAM
305-2963 Glen Dr
V3B 2P7
Phone: (604) 927-2912
Fax: (604) 927-2914

SURREY
101-17720 57th Avenue
V3S 1H2
Phone: (604) 576-3771
Fax: (604) 576-3769

NORTHERN REGION

DAWSON CREEK
102-1508 102nd Ave
V1G 2E2
Phone: (250) 784-1310
Fax: (250) 784-2424

PRINCE GEORGE
203 -1577 7th Ave
V2L 3P5
Phone: (250) 565-4465
Fax: (250) 565-4327

TERRACE
3250 Eby St
V8G 5H4
Phone: (250) 638-6582
Fax: (250) 638-6587

WILLIAMS LAKE
112A 540 Borland St
V2G 1R8
Phone: (250) 398-4884
Fax: (250) 398-4208

GUIDE TO B.C.'S PUBLIC POST-SECONDARY INSTITUTIONS

British Columbia s 28 public post-secondary education institutions offer more than 1,300 programs covering a broad spectrum of subjects. The 2000 Guide to B.C. s Public Post-secondary Institutions summarizes these programs into broad categories, indicates which institutions offer them, and the type of credential available within each program category. For detailed information about specific programs, application procedures and admission requirements, please refer to the course calendar published by each institution, or contact them directly. The address, phone number and Web site of each institution is listed on the Institution Descriptions on (pages 612 to 619). Course calendars are available at public libraries across the province, and most are available on-line at each institution s Web site.

Each individual program is not listed in the guide. Further information about programs is also available online at http://openingdoorsbc.com. Opening Doors is a searchable database profiling over 1,380 individual programs available at all B.C. public post-secondary colleges, institutes, university-colleges and universities. Students and learners can find programs by field of study, subject, program length or institution and then copmpare important decisions like admission requirements, tuition fees, start date and program profile. These features are complemented by additional information on student finances, on-campus student services, and a reference section detailing former student experiences and their transitions to further education and the labour market.

Brief descriptions of each type of institution and the kind of certification they provide are listed below:

Colleges provide courses and programs leading to certificates, diplomas and associate degrees in vocational, career, technology, trades and academic studies. Credit earned for some courses offered at colleges can be transferred to B.C. universities or university colleges.

University colleges offer undergraduate degrees, often in specialized subject areas, as well as certificate and diploma programs. They also offer courses for which the credits can be transferred to universities or other university colleges.

Institutes are organized according to career, vocational and technical specialties, covering a variety of occupations. They may offer credentials from certificates to degrees.

Universities provide undergraduate and graduate degree programs in a variety of disciplines. Many B.C. universities also offer certificates and diplomas in selected professional fields.

Symbols that link columns and rows indicate the type of credential available. These credentials are explained in detail on the credentials on (page 601).

Additional Guide Information

Every attempt has been made to ensure the accuracy and completeness of the information in this booklet. Program offerings are subject to change, so we encourage you to contact the institution of your choice directly for the latest information.

Please note that this program guide does not include programs offered at private post-secondary institutions, or continuing education programs.

This guide lists only credential programs. There may be more than one program offered at an institution for any given subject area.

University transfer credits on a course-by-course basis are not listed in this guide. All community colleges have agreements with public universities and with other colleges about which credits will be accepted as transferable. All decisions with respect to the transferability of courses should be confirmed with the institution concerned. A Transfer Guide and student transfer handbook is published by:

The British Columbia Council on Admissions & Transfer
709 - 555 Seymour Street
Vancouver, B.C. V6B 3H6
Phone: (604) 412-7700
Fax: (604) 683-0576
E-mail: admin@bccat.bc.ca.

The Transfer Guide can also be found at most public libraries, high schools and post-secondary institutions, and is available on-line through BCCAT s Web site at http://www.bccat.bc.ca/.

Programs that include a co-operative education component are noted with an asterisk (*) in the guide, but no distinction is made between mandatory and optional co-op programs. Programs that include a practicum or other type of work experience are not recognized in the guide, even though such work experience may be a mandatory part of the program. For specific details about co-operative education, contact the institutions directly.

Opportunities B.C. students to enrol in veterinary medicine or optometry programs are provided through inter-provincial agreements. Students interested in veterinary medicine should contact the University of Saskatchewan in Saskatoon and those interested in optometry should contact the University of Waterloo in Ontario.

CREDENTIAL DEFINITIONS

A — Associate Degree

There are two types of Associate degrees: the Associate of Arts degree and the Associate of Science. To earn an Associate degree, a student must complete 60 semester credits in a clearly defined program of first and second year university transfer courses. These are awarded by colleges, university colleges and institutes.

AC— Advanced Certificate

The Advanced Certificate is offered to students who already have a certificate and complete additional specialized courses. These are awarded by colleges and universities.

AD – Advanced Diploma or Post Diploma

The Advanced Diploma or Post Diploma is awarded following an additional year of study after graduation from a two-year diploma program. These are awarded by colleges and institutes.

AP – Apprenticeship Training

Apprenticeship Training refers to the combination of prescribed periodic in-school technical training and paid work experience, which an apprentice must complete in order to graduate from their apprenticeship program. The in-school technical training is most often delivered by colleges, university colleges and institutions.

Students must be registered with an employer and indentured in a trade in order to participate in the training. Class placements in specific programs are made by Industry Training and Apprenticeship Commission (ITAC) Counsellors.

For further information on apprenticeship training in B.C., visit the ITAC Web site at www.itac.gov.bc.ca.

B – Bachelor's Degree

Bachelor s degree programs normally take four years of full-time study to complete. Many offer options in particular disciplines as well as a more specialized honours option. These are awarded by university colleges, institutes and universities.

C – Certificate

Certificate programs usually involve one year or less of study. These are awarded by colleges, university colleges, institutes and universities.

CS – Concentrated Study

Concentrated Study refers to programs offered at the Bachelor level where a major is not available in the program area. This designates a program in the form of a minor, extended minor, concentration, specialty or discipline. These are awarded at university colleges and universities.

D – Diploma

The diploma normally involves two years of study in a career, technical, or academic program. These are awarded at colleges, university colleges, institutes and universities.

M – Master's Degree

A Master s degree program normally takes two years of study and may involve research or writing a thesis. Admission usually requires completion of a Bachelor s degree. These are awarded at universities only.

P – Post Baccalaureate Diploma

The Post Baccalaureate Diploma involves one or two years of specialized study in a certain discipline following completion of a Bachelor s degree. (In special cases other criteria may be used instead of a degree.) These are awarded at colleges, university colleges, institutes and universities.

PD – Provincial Diploma (High School Equivalence)

The requirements for a Provincial Diploma or high school equivalence certificate are provincial level English, advanced level mathematics and three other provincial level courses. These are awarded at colleges, university colleges, and institutes.

PhD – Doctoral Degree

Doctoral programs involve course work and original research that must be written as a thesis and successfully defended. Admission to a doctoral program usually requires completion of a Master s degree, or a Bachelor s degree with special qualifications. These are awarded at universities only.

UBT – University Block Transfer

All colleges, university colleges and institutes offer some courses that are accepted by universities as being equivalent to their own for the purpose of course credit. Some institutions group these courses into specific programs that transfer to specific university faculties or departments. Please note that not all UBTs are listed.

V – Various Courses

This symbol indicates that various credit and non-credit courses on the subject are offered and may lead to one or more credentials. These are awarded by colleges, university colleges, institutes and universities.

*** – Co-operative Education (*)**

Many post-secondary institutions offer co-operative education programs, which formally combine paid work terms with periods of classroom instruction. Through co-op programs, students are able to gain experience in their chosen occupations and are paid for their time. Co-op programs are available at the Certificate level up to the PhD level.

Guide to British Columbia's Public Post-secondary Institutions (2001)

A = Associate Degree
AC = Advanced Certificate
AD = Advanced Diploma
AP = Apprenticeship
B = Bachelor s Degree
C = Certificate
CS = Concentrated Study
D = Diploma
M = Master s Degree
P = Post Baccalaureate Diploma
PD = Provincial Diploma
PhD = Doctoral Degree
UBT = University Block Transfer
V = Various Courses
* = Co-op Education

	COLLEGES										
	Camosun College	Capilano College	College of New Caledonia	College of the Rockies	Douglas College	Langara College	North Island College	Northern Lights College	Northwest Community College	Selkirk College	Vancouver Community College
ABORIGINAL PROGRAMS											
Adult Basic Education	PD	PD	PD				PD	PD			
Business/Management Related		C		C							
Education (Teacher Training)											
Fine, Visual and Performing Arts		C									
First Nations Related Studies			V	V		A,C,D,V	V	V	V		V
Health											
Legal and Social Service	C,UBT										
Liberal Arts and Humanities											
Natural Resources Management Related											
AGRICULTURE AND NATURAL RESOURCES											
Agriculture						C,UBT					
Animal Studies/Management											
Aquaculture/Fisheries		C					C				
Environmental Studies/Science	A,D*	P			A*,AC*,V*	D,UBT	A,D	D		D*	
Food Sciences/Technology											
Forestry Related			C,D	V			C,D	C,D		D*,UBT	
Horticulture/Floral Related	C	C		C							
Natural Resources Management/Wildlife Related							D		C*,D*	D*	
Water Quality/Wastewater Management											
BASIC EDUCATION/UPGRADING											
Academic/Basic Upgrading	C,V	C,D,V	C,D,PD,V	C	V	V	C,D	C,D	C,D	C	C,V
Adult Special Education	V	V	C	V	V		V	V	C	C	C,V
Employment Preparation	C				V		V	C	C		C,V
English as a Second Language	C,V	C,V	C	V	V		V	C,V	V	C	C,V
Trades/Technology Access & Bridging	UBT,V		V						C		C
BUSINESS/MANAGEMENT RELATED											
Accounting	C	V	D*		C,D*	AD,D*, UBT					C
Business Admininstration/ Management/Commerce	C,D*	AC,AD,B,C, D*,UBT	C	C,D*, UBT	D*	D,UBT	C,D*	C,D	C,D*	D*	
Economics											
Entrepreneurship/Small Business Mgt.	C				C	C					
Finance			D*		D*,V	D*,UBT					
Human Resources Related	C										
International Business	D	P*				D,UBT					
Marketing		C	D*		C,D*	D*,UBT					
Operations Management/Supervision											
Other Business	C*,D*	C		C	C						C
Public Administration	C,D*	C		C							
Real Estate											
Technology Management											
COMMUNICATIONS											
Communications - General	D*	C,D	D*	D		D			C	D	C
Journalism (Print & Broadcast)						C,D					
Writing (Creative, Editing, Technical)					D						

Information contained in this matrix was accurate at the time of printing, but is subject to change.

Guide to British Columbia's Public Post-secondary Institutions (2001)

UNIVERSITY COLLEGES					INSTITUTES						UNIVERSITIES					
Kwantlen University College	Malaspina University College	Okanagan University College	University College of the Cariboo	University College of the Fraser Valley	British Columbia Institute of Technology	Emily Carr Institute of Art and Dance	Institute of Indigenous Government	Justice Institute of B.C.	Nicola Valley Institute of Technology	Open Learning Agency B.C. Open University	Royal Roads University	Simon Fraser University	Technical University of B.C.	University of British Columbia	University of Northern B. C.	University of Victoria
ABORIGINAL PROGRAMS																
		PD	PD						PD							
									C,D,UBT	C				B	C	
				B,C								C,M,V		B,C,M,PhD		
						V			V							
	B,V						A,C		D	V		B,C		V	B,C,M	M,V
	V								C					V	V	V
	V							C	B			P		V	V	D,V
												C		B		
					C				C,D							
AGRICULTURE AND NATURAL RESOURCES																
				C,D*										B,M		
C,V			B,D	C								M				
	B,D*													D	B*	
D*		B*,D*	B*,C		B,D						B,M	B*,M*,P, PhD*		B,M,PhD	B*,M,PhD	D
					B,D									M,PhD		
	D	UBT	D,UBT		D*									B*,D,M, PhD	B*	
AP,C,D,V	C		C,D	C												
	D		B*		AD,D*				C*,D*			M*,PhD*		B,M,PhD	B*,M,PhD	
		D*														
BASIC EDUCATION/UPGRADING																
PD	C,D	C,D,V	C	C,D	V					C,D,V		C				
V	V	C,V	C													
PD,V	V	V	C					V								
C,V	C	C,V	C	V	V					V						
					V											
BUSINESS/MANAGEMENT RELATED																
C,D	C		B,C,D	C	B									D		
B,C,D	B,C,D, UBT	B*,C,D*	B,C,D	B*,C,D*	AC,B,D				C*,D*	B,C,D	B,M	B*,D,M,P		B*,M,PhD	B*	B*,M
		B	B									B*		B*	B*	B*
B											B					
					D											
					D						M					
					D											
C,D				C	D											
					D			C,V								
C,D		C	D		B			B		C						
										B	V				C	C,D,M
										B				B		
					B					B			B			
COMMUNICATIONS																
D				A*		B*,D*		V				B*,M,P, PhD				
D			B		D									M		
	B							V						B,D,M		B*,P

Guide to British Columbia's Public Post-secondary Institutions (2001)

A = Associate Degree
AC = Advanced Certificate
AD = Advanced Diploma
AP = Apprenticeship
B = Bachelor s Degree
C = Certificate
CS = Concentrated Study
D = Diploma
M = Master s Degree
P = Post Baccalaureate Diploma
PD = Provincial Diploma
PhD = Doctoral Degree
UBT = University Block Transfer
V = Various Courses
* = Co-op Education

	COLLEGES										
	Camosun College	Capilano College	College of New Caledonia	College of the Rockies	Douglas College	Langara College	North Island College	Northern Lights College	Northwest Community College	Selkirk College	Vancouver Community College
COMPUTER AND INFORMATION SERVICES											
Computer Information Systems/Science	D*	C,D*	C,D*		AD,C,D*	AD,C,D*, UBT,V	C, D*		C	D*	C
Computer Maintenance Related			D	C							
CONSTRUCTION AND METAL TRADES											
Architecture											
Carpentry/Joinery	AP,C		AP,C	C				AP,C	AP,C		
Drafting			C,D*				C				C
Electrical Related	AP,C		AP,C				AP,C			AP,C	
Fine Woodworking/Furniture Related	C									C	
Machinist			C							C	
Painting/Wallcovering											
Plumbing/Pipefitting	AP,C										
Sheet Metal Work	AP,C										
Tool & Die Making											
Welding	AP,C,V		AP,C	AP,C			AP,C	AP,C	AP,C	C	
EDUCATION (TEACHER TRAINING)											
Adult Education	C								D		B,D
Early Childhood Education	C,D	C,D	C	C,D	C,D	D,V	C,D	C,D,V	C	C	
Education (General)											
Elementary/Secondary Related				B,C				C		B	
English as a Second Language Teaching											
Teacher Assistant/Aide		C	C			C,D		C			
Technology Education											
ENGINEERING, ELECTRICAL AND ELECTRONICS											
Automation/Robotics											
Civil Engineering/Civil Tech. Related	C,D*		D*								
Computer Engineering Related	D*,UBT,V										
Computer Maintenance			D								
Construction Building Technology											
Electrical, Electronic & Communications Engineering	C,D*, UBT,V		C,D*,V				D,V				C,D
Engineering (General)		UBT				C				UBT	
Heating, Air Conditioning & Refrigeration							C				
Mechanical Engineering	C,D*, UBT,V										
Mining and Petroleum Related											
Plastics Technology											
Surveying and Mapping			AD*								
FINE, VISUAL AND PERFORMING ARTS											
Animation, Film & Video		C,D									
Applied Design (Fashion, Graphic, Interior, Visual, etc.)	D	D				D	D	C,D	C		C,D
Crafts, Folk Art and Artisanry		AC,D									D
Dance											
Drama/Theatre Arts		AC,D			D	D					
Fine Arts - General		C,D				D	D	D			
Music Related	D	B,D			C,D,UBT					D	D
Photography						D	C				

Information contained in this matrix was accurate at the time of printing, but is subject to change.

Guide to British Columbia's Public Post-secondary Institutions (2001)

UNIVERSITY COLLEGES					INSTITUTES						UNIVERSITIES					
Kwantlen University College	Malaspina University College	Okanagan University College	University College of the Cariboo	University College of the Fraser Valley	British Columbia Institute of Technology	Emily Carr Institute of Art and Dance	Institute of Indigenous Government	Justice Institute of B.C.	Nicola Valley Institute of Technology	Open Learning Agency B.C. Open University	Royal Roads University	Simon Fraser University	Technical University of B.C.	University of British Columbia	University of Northern B. C.	University of Victoria
COMPUTER AND INFORMATION SERVICES																
B*,C,D*	D	D*	B*,D*	B*,D*	B,D					B,C,D		B*,C,P	B,M	B*,D,M, PhD	B*	B*,M,PhD
C	C		D*		C, D											
CONSTRUCTION AND METAL TRADES																
														M		
C	AP,C	AP,C	AP,C	AP,C	AP,C											
C,V				C	AD,C,D											
			AP,C	AP	AP,C											
C																
					AP,C,D*											
					AP,C											
			AP,C		AP,C											
					AP,C											
					AP,D*											
C,V	C	C	AP,C	C	AP,C											
EDUCATION (TEACHER TRAINING)																
				B,V												
C,V	C,D	C	C,D	C,D												
								C				M,P,PhD		D,M,PhD	M	M,PhD
	B,UBT	B	B		B,D							B,C		B		B*,C,D
												C,P				D
	C															
					B,D						M					
ENGINEERING. ELECTRICAL AND ELECTRONICS																
D			D*		D											
		D*	D		D									B*,M,PhD		
												B*	B	B*,M,PhD		B*
C	C		D*		C,D											
					B,D											
D		D*	C,D*		B,C,D*							B*	B	B*		B*
UBT	UBT	UBT	D,UBT	UBT	B							B*,M,PhD		B*,M,PhD		B*,M,PhD
	C				D*											
		D*			D									B*,M,PhD		B*
					D									B*,M,PhD		
					D											
					AD,B,D							C				
FINE. VISUAL AND PERFORMING ARTS																
						B*,D*						B	B	B*,D,M		
B,C,D	D,UBT	B	D	D		B*,D*				B		B				B*,M
												B				
	UBT			A*,D*								B		B*,C,M, PhD		B*,M,PhD
C,D	B,UBT	B,D	B,C,D	D		B*,D*				B		M		B*,M,PhD		B*,C,D,P
A,C,D	D,UBT									B		B		B*,D,M, PhD		B*,C,M, PhD
						B*,D*										

Guide to British Columbia's Public Post-secondary Institutions (2001)

A = Associate Degree
AC = Advanced Certificate
AD = Advanced Diploma
AP = Apprenticeship
B = Bachelor s Degree
C = Certificate
CS = Concentrated Study
D = Diploma

M = Master s Degree
P = Post Baccalaureate Diploma
PD = Provincial Diploma
PhD = Doctoral Degree
UBT = University Block Transfer
V = Various Courses
* = Co-op Education

	COLLEGES										
	Camosun College	Capilano College	College of New Caledonia	College of the Rockies	Douglas College	Langara College	North Island College	Northern Lights College	Northwest Community College	Selkirk College	Vancouver Community College
HEALTH											
Animal Health/Science											
Biomedical Engineering/Technology											
Dental Related	C,D		C,D	C	C						C,D
Diagnostic Technology & Related											C
Environmental/Occupational Health											
Health Care Administration					D						
Health/Medical - General											
Home Support/Resident Care Related	C	C	C	C	V		C	C	C	C	C
Nursing Related											
Nutrition and Dietary Related						D,UBT					
Optical/Eye Care Related					C,D						
Pharmacy/Pharmacology Related											C
Practical Nursing (LPN) Related				C							C
Psychiatric Nursing Related					AD,D,V						
Registered Nursing (RN) Related	D		B	V	D,UBT	D,UBT	B,D			D	
Rehabilitation/Therapeutic Services		B			D						
HOSPITALITY, TOURISM AND SERVICE											
Adventure Tourism	C			C			C		C		
Baking/Cooking/Chef Training	AP,C		C	D			C	C	C	C	AP,C,V
Building Service Worker											C
Food/Beverage Services							C				C
Hairstyling/Grooming										C	C
Hospitality/Tourism - General		C					C	C		C	C
Hospitality/Tourism Management	D*	B,D*	C*,D*	C,D	D*		D			C,D*	D*
Institutional Aide											C
Travel Industry Related	C						C				C
LEGAL AND SOCIAL SERVICES											
Child/Youth Care Work					C,D						
Court Reporting						C,D					
Criminal Justice/Criminology	A,D		D		C,D	D					
Fire Fighting Related											
Gerontology											
Human Services - General		C	C								C
Human/Social Service Work	C,D		C,D	C	C,D	C,D	C,D	D	C,D	C,D	
Interpreting/Sign Language					D						C,V
Law											
Legal Assistant		C,D								C	
Library Studies Related						D					
Protective Services											
Social Work			D								

Information contained in this matrix was accurate at the time of printing, but is subject to change.

Guide to British Columbia's Public Post-secondary Institutions (2001)

UNIVERSITY COLLEGES					INSTITUTES						UNIVERSITIES					
Kwantlen University College	Malaspina University College	Okanagan University College	University College of the Cariboo	University College of the Fraser Valley	British Columbia Institute of Technology	Emily Carr Institute of Art and Dance	Institute of Indigenous Government	Justice Institute of B.C.	Nicola Valley Institute of Technology	Open Learning Agency B.C. Open University	Royal Roads University	Simon Fraser University	Technical University of B.C.	University of British Columbia	University of Northern B. C.	University of Victoria
HEALTH																
			C,D,V											M,PhD,V		
					D											
	C	C	V	C										C,D,M,P, PhD		
			AD,D,V		AD,B,D					B				B,M,PhD		
					B,D									M,PhD		
	D										V			M,PhD		B*
														M,PhD	M	
V	C	C	C	C						C						
														M,PhD		M
												C		B,M,PhD		
			V											B*,M,PhD		
	C	C								C						
										B						
B,C,D,V	B,C,D	B,D	B,C,D	B,D	B,D					V				B	B,C,P	B
		C	V		D					B				B,M		
HOSPITALITY, TOURISM AND SERVICE																
			B,D													
	C	C	AP,C													
			C													
	C															
	D*	C,V	C					C,V							B*	
	B*,D*		B,C,D							B						
LEGAL AND SOCIAL SERVICES																
	B,D,P			B				V								B,M
C,D	D,UBT		C	B,D				C,V				B*,C,M,P, PhD				
								D,V								
												M,P				
C								C,V			AC					M
C	C,D	C	C	C,D				C		C						
														B,M,PhD		B*
			C													
				D										C,M		D
								C								
		B	B	B				C	B					B,M	B,M	B,M

Guide to British Columbia's Public Post-secondary Institutions (2001)

A = Associate Degree
AC = Advanced Certificate
AD = Advanced Diploma
AP = Apprenticeship
B = Bachelor s Degree
C = Certificate
CS = Concentrated Study
D = Diploma
M = Master s Degree
P = Post Baccalaureate Diploma
PD = Provincial Diploma
PhD = Doctoral Degree
UBT = University Block Transfer
V = Various Courses
* = Co-op Education

	COLLEGES										
	Camosun College	Capilano College	College of New Caledonia	College of the Rockies	Douglas College	Langara College	North Island College	Northern Lights College	Northwest Community College	Selkirk College	Vancouver Community College
LIBERAL ARTS AND HUMANITIES											
1st & 2nd Year Academic Studies (Arts)	A,V	A,C,D,V	A,UBT	A,C,UBT	A*,C,D*, UBT	A,D,UBT	A,UBT	A,UBT	A,UBT	A,UBT	
Anthropology											
Architecture (Arts)											
Arts - General Studies											
Arts - Misc. Majors											
Arts - Other											
Canadian Studies											
Classics Related											
Community and Regional Planning (Arts)											
Economics (Arts)											
English/Literature Related											
Environmental Studies Related (Arts)											
First Nations Studies Related				C			V				
Foreign Language Studies											
French Language Studies Related											
French Studies Related											
Geography (Arts)											
History											
International Relations/Studies											
Linguistics (Arts)											
Math/Statistics Related (Arts)											
Philosophy											
Political Science											
Psychology (Arts)				C							
Religious Studies Related											
Sociology											
Women s Studies											
MECHANICAL RELATED											
Aircraft Mechanic/Maintenance								D			
Auto Body Repair Related	AP			C							AP,C
Auto Mechanics	AP,C		AP,C*	C			C,V	D*	C	AP,C	AP,C
Business Machine Repair											
Diesel Engine Mechanic											C
Heavy Equipment Maintenance & Repair	C		AP,C	C			C,V	C*	C	C	
Millwright			AP,C						C	C	
Misc. Mechanics & Repair	C										
Parts and Light Warehousing											
Security Alarm Installer											
Small Engine Mechanics & Repair									C		
OFFICE ADMINISTRATION											
Accounting/Finance	C	C	C		C			C			C
Legal Secretarial	C	C	C		C,V						C
Medical/Dental Related	C	C			C					C	C
Office Administration/Management (General)	C*,D*	C	C	C,D	C,D*,V		C*	C,D	C	C,D	C

Information contained in this matrix was accurate at the time of printing, but is subject to change.

Guide to British Columbia's Public Post-secondary Institutions (2001)

UNIVERSITY COLLEGES					INSTITUTES						UNIVERSITIES					
Kwantlen University College	Malaspina University College	Okanagan University College	University College of the Cariboo	University College of the Fraser Valley	British Columbia Institute of Technology	Emily Carr Institute of Art and Dance	Institute of Indigenous Government	Justice Institute of B.C.	Nicola Valley Institute of Technology	Open Learning Agency B.C. Open University	Royal Roads University	Simon Fraser University	Technical University of B.C.	University of British Columbia	University of Northern B. C.	University of Victoria
LIBERAL ARTS AND HUMANITIES																
A,C,D, UBT	A,UBT	A,D,UBT	A,C,UBT	A*,D,UBT					D	A,C,D						
A	B	B	B									B*,M,PhD		B*,M,PhD	B*	B*,M
														M		
	B	B	B	B						B		B		B*	B	
	B											B*		B*,M,PhD	B*	B*
											M,V	C,M,P,PhD		B,D,M,PhD	M	D,M,PhD
			B									B,C		B*		D
														B*,M,PhD		B*,M
														M,PhD		
		B	B									M,PhD		B,M,PhD		M
	B	B	B	B						B		B*,M,PhD		B*,D,M, PhD	B*	B*,M,PhD
											M,V			M,PhD	B*,M,PhD	
	B,UBT						A,C		D*			C		B*	B*,C,M	C,M
												C,M		B*,M,PhD		B*,M
												B		B*		B*
												C,M,P		M,PhD		M
			B	B								B*,C,M,P, PhD		B*,M,PhD	B*	B*,M,PhD
	B	B	B	B						B		B*,C,M,P, PhD		B*,M,PhD	B*,M	B*,M,PhD
		B		A*										B*,M	B*,M	
												B,C,M, PhD		B*,D,M, PhD		B*,D,M, PhD
		B	B									B*,M,PhD		B*,M,PhD		M,PhD
		B										B*,M,PhD		B*,M,PhD		B*,M
		B										B*,M,PhD		B*,M,PhD	B*,M	B*,M
A	B	B	B	B						B		B*,M,PhD		B*,M,PhD		B*,M,PhD
														B*,M		
A	B	B	B	B						B		B*,M,P, PhD		B*,M,PhD		B*,M
												B*,C,M		B*,M	B*	B*
MECHANICAL RELATED																
					C,D											
C		AP,C,V			D*											
AP,C	AP,C	AP,C	C	AP,C	AP,C,D*											
					D											
					C											
	AP,C	C	AP,C	C	AP,C,D											
AP,C					AP,C											
C					AP,C*											
AP,C			C	C												
					C											
AP,C	C		C		C											
OFFICE ADMINISTRATION																
	C	C	C,V	C												
		C														
			C, V													
C	C	C	C	C,V						C						

Guide to British Columbia's Public Post-secondary Institutions (2001)

A = Associate Degree
AC = Advanced Certificate
AD = Advanced Diploma
AP = Apprenticeship
B = Bachelor s Degree
C = Certificate
CS = Concentrated Study
D = Diploma
M = Master s Degree
P = Post Baccalaureate Diploma
PD = Provincial Diploma
PhD = Doctoral Degree
UBT = University Block Transfer
V = Various Courses
* = Co-op Education

	COLLEGES										
	Camosun College	Capilano College	College of New Caledonia	College of the Rockies	Douglas College	Langara College	North Island College	Northern Lights College	Northwest Community College	Selkirk College	Vancouver Community College
PHYSICAL EDUCATION/RECREATION/LEISURE											
Coaching					D	D					
Human Kinetics/Kinesiology/Physical Education			D	C	D	D					
Leisure Studies/Recreation - General											
Parks, Recreation & Leisure Facilities Management	C*,D*	D		C,D		AD,D, UBT				D	
Recreation Leadership Related	C					AD,D, UBT					
SCIENCES											
1st & 2nd Year Academic Studies (Science)	A,D,V	A,D,V	A,UBT	A,UBT	A*,C,D, UBT	A,D,UBT	A,UBT	UBT	A,UBT	A,UBT	
Architecture (Science)											
Astronomy											
Atmospheric Science											
Biochemistry	D										
Biochemistry/Microbiology											
Biology											
Chemistry	D										
Community and Regional Planning (Science)											
Computing Science/Systems Related											
Economics (Science)											
Environmental Studies Related (Science)											
Geography/Earth Sciences Related											
Human Kinetics/ Kinesiology/Physical Education											
Linguistics (Science)											
Math/Statistics (Science)											
Physics											
Psychology (Science)											
Science - General Studies											
Science - Misc. Majors											
Science - OTHER											
Speech Sciences (Science)											
TRANSPORTATION (AIR, LAND, MARINE)											
Aviation (Pilot) Training										D	
Driver Training							V	C			
Marine Training	V						C,V		V		

Information contained in this matrix was accurate at the time of printing, but is subject to change.

Guide to British Columbia's Public Post-secondary Institutions (2001)

UNIVERSITY COLLEGES					INSTITUTES						UNIVERSITIES					
Kwantlen University College	Malaspina University College	Okanagan University College	University College of the Cariboo	University College of the Fraser Valley	British Columbia Institute of Technology	Emily Carr Institute of Art and Dance	Institute of Indigenous Government	Justice Institute of B.C.	Nicola Valley Institute of Technology	Open Learning Agency B.C. Open University	Royal Roads University	Simon Fraser University	Technical University of B.C.	University of British Columbia	University of Northern B. C.	University of Victoria
PHYSICAL EDUCATION/RECREATION/LEISURE																
	D,UBT		UBT									B*		B		B*
				C*,D*												
	B*,D*															B*
SCIENCES																
A,D,UBT	A,UBT	A,D,UBT	A,UBT,V	A*,UBT						A		V		V		
														M		
			V											B,M,PhD		B*,M,PhD
														B*,D,M, PhD		
			B									B*		B*		B*
												M,PhD		B*,M,PhD		M,PhD
	B	B*	B*	B*						B		B*,M,P, PhD		B*,M,PhD	B*	B*,M,PhD
		B*	B*									B*,M,PhD		B*,M,PhD	B*,M	B*,M,PhD
														M,PhD		
		B*	B*	B*	B,D					B	C,M	B*,M,P, PhD	B	B*,M,PhD	B*,M	B*,M,PhD
														M		
		B*	B*								B,M,V	B*,M		B,M,PhD	B*,M,PhD	
			B		AD,B							B*,M,PhD		B,M,PhD	B*	B*,M,PhD
												C,M,P,PhD		M,PhD		M
																B
		B*	B									B*,C,M, PhD		B*,M,PhD	B*,M	B*,M,PhD
		B*	B*									B*,M,PhD		B*,M,PhD	B*,M	B*,M,PhD
														B	B*,M	B,M,PhD
		B	B							B		B		B*	B	
		B*	B									B*		B		B*
												M,PhD		M,PhD		
														M,PhD		
TRANSPORTATION (AIR, LAND, MARINE)																
		D		B,D												
	C							C,V								
					C,D*											

British Columbia Institute of Technology
3700 Willingdon Ave.
Burnaby, B.C. V5G 3H2
Tel: (604) 434-1610
Fax: (604) 433-1184
www.bcit.bc.ca

British Columbia Institute of Technology (BCIT) is one of Canada's leading institutes of advanced technology and trades training, offering applied research and training in a wide range of subject areas including engineering technology, electronics, trades, business, health sciences and computers. Through its full-time and part-time programs, BCIT provides British Columbians with world-class, job-ready skills for career success. In addition to the main campus in Burnaby, BCIT has other campuses in downtown Vancouver, North Vancouver (maritime training) and Richmond at the Vancouver International Airport (aviation training). BCIT serves more than 15,000 full-time students (including 4,500 trades apprentices) and more than 29,000 part-time students each year. BCIT grants one-year certificates, two-year diplomas, advanced diplomas and degrees.

Camosun College
3100 Foul Bay Road
Victoria, B.C. V8P 5J2
Tel: (250) 370-3000
Fax: (250) 370-3551
www.camosun.bc.ca

Since 1971 Camosun College has served the educational and training needs of the people of the Southern Vancouver Island and the Gulf Islands. Camosun is comprised of two main campuses: Lansdowne and Interurban. The Lansdowne campus provides educational opportunities to over 4,500 students in access programs, arts, sciences, health and human services, business and international education. The Interurban campus provides state-of-the-art learning facilities to more than 3,100 students in access programs, business, trades, technologies and international education. As well, over 10,000 students each year enroll in Camosun s broad range of non-credit continuing education programs. Educational advising, career resource centres, learning skills centres, libraries, counselling, recreation and athletics, disability support services and day care are just some of the many professional support services offered by the College to ensure student success. One of Camosun s newest and most innovative divisions is the *idea*centre, located in the heart of downtown Victoria. The *idea*centre serves as a technology and innovation centre for encouraging and developing high technology applications with business and industry.

Capilano College
2055 Purcell Way
North Vancouver, B.C. V7J 3H5
Tel: (604) 986-1911
Fax: (604) 984-4985
www.capcollege.bc.ca

Since its establishment in 1968, Capilano College has grown steadily and has a current enrolment of about 6,500 students. The main campus in North Vancouver draws students from communities across the Lower Mainland, and campuses in Squamish and Sechelt directly serve students in the Howe Sound and Sunshine Coast regions. The college s program offerings include university transfer, career and vocational programs, career and academic preparatory courses, English as a second language, continuing education, and contract services. Courses are offered in fall, spring and summer terms. Students have access to a wide range of options to meet their educational goals, including: employment-oriented programs leading to a certificate or diploma; associate degrees in Arts or Science; bachelor degrees, offered in partnership with the Open University, in Business Administration, Tourism Management, Jazz Studies, and Music Therapy; and post-baccalaureate programs in Environmental Science, Asia Pacific Management, and Art.

College of New Caledonia
3330 - 22nd Ave.
Prince George B.C. V2N 1P8
Tel: (250) 562-2131
or: 1-800-371-8111
Fax: (250) 561-5816
www.cnc.bc.ca

The College of New Caledonia has been an institution of first choice for students of B.C.'s central interior since 1969. The main campus is located in Prince George with other campuses located in the communities of Burns Lake, Mackenzie, Quesnel and Vanderhoof. Students may choose from a wide range of programs including business and management, college foundations, health science, social services, technology, trades and university credit courses. The college is working with its university partner, the University of Northern British Columbia, to enable students to build upon college studies and obtain university degrees.

College of the Rockies
PO Box 8500
Cranbrook, B.C. V1C 5L7
Tel: (250) 489-2751
or: 1-877-489-2687
Fax: (250) 489-1790
www.cotr.bc.ca

College of the Rockies is located in the beautiful Canadian Rocky Mountains in the southeastern corner of British Columbia. The College's main campus is located in Cranbrook, one of the sunniest cities in Canada. This small, safe and friendly community is located only a short drive from the United States border and only a few hours from scenic Banff, Alberta.

The College programs fit their spectacular setting and include training in Lifestyle and Sports Management, Mountain Activity Sports, Adventure Tourism, Culinary Arts, Horticulture, Events Management, Tourism and Hospitality as well as a full range of regular program options.

COTR's bright modern student residence is located meters from the Cranbrook campus main building and offers access to some of the finest recreational trails and facilities in the region. COTR students are provided with the best learning technology available, including free internet and e-mail access, a tutoring centre, computer learning labs and a graphic centre.

Douglas College
PO Box 2503
New Westminster, B.C. V3L 5B2
Tel.: (604) 527-5400
Fax: (604) 527-5095
www.douglas.bc.ca

Douglas College, established in 1970, enrolls over 10,000 students each year in credit programs. One of the largest community colleges in B.C., Douglas College serves students from throughout the Lower Mainland and B.C. Its campuses are located in New Westminster, Coquitlam and Maple Ridge. The College offers a wide variety of programs which include university transfer, vocational, career and college preparatory programs. Students may also access career, educational and personal counseling, as well as prior learning assessment and recognition services and cooperative education. Special services for disabled students are also available.

Emily Carr Institute of Art & Design
1399 Johnston Street
Vancouver B.C. V6H 3R9
Tel: (604) 844-3800
or: 1-800-832-7788
Fax: (604) 844-3801
www.eciad.bc.ca

Emily Carr Institute of Art and Design, established in 1925, is located on popular Granville Island in Vancouver. The Institute offers four-year Bachelor's and diploma programs in visual arts, media arts and design. The programs are studio-based professional programs that encourage interdisciplinary learning and critical inquiry. Admission to the Institute is competitive and is based upon academic qualifications and a rigorous assessment of an admission portfolio.

Institute of Indigenous Government
342 Water St., 3rd Floor
Vancouver B.C. V6B 1B6
Tel: (604) 602-9555
Fax: (604) 602-3400
www.indigenous.bc.ca

The mission of the Institute of Indigenous Government is to provide an accredited specialized program of post-secondary education, skills training and research opportunities dedicated to empowering indigenous peoples to exercise effectively their right to self determination in their territories, in a way which fully reflects indigenous philosophy, values and experience throughout the world. The IIG overall program focus is indigenous government studies, with four principal areas of specialization: political development and leadership, indigenous government administration, economic and social development, and international indigenous relations.

Justice Institute of British Columbia
715 McBride Blvd.
New Westminster, B.C. V3L 5T4
Tel: (604) 525-5422
Fax: (604) 528-5518
www.jibc.bc.ca

The Justice Institute of British Columbia was established in 1978, and has a provincial mandate to provide training for people who work in the justice system and in public safety. The Institute offers over 400 courses in a wide range of areas: corrections, courts, fire fighting, conflict resolution, emergency medical services, law enforcement, emergency management, social services, and advanced driver training. Each year over 35,000 students take courses offered by the Justice Institute.

Kwantlen University College
12666 - 72nd Avenue
Surrey, B.C. V3W 2M8
Tel: (604) 599-2100
Fax: (604) 599-2068
www.kwantlen.bc.ca

Kwantlen University College serves the south Fraser Valley region (Delta, Langley, Richmond, Surrey and White Rock) with two Surrey campuses, one Langley and one Richmond campus. Kwantlen is the largest University College in Canada with 23,000 regular and Continuing Education students. A degree-granting institution and comprehensive community college with five different undergraduate degrees, Kwantlen has over 90 programs in the areas of University Studies, Applied Design, Business, Community & Health Studies, Horticulture & Equine Studies, Technology, Trades & Vocational, Industry, Preparatory and Continuing Education. Kwantlen also provides a variety of services to students, including Athletics and Recreation. The University College serves a culturally diverse area with a wide variety of educational needs.

Langara College
100 West 49th Avenue
Vancouver, B.C. V5Y 2Z6
Tel: (604) 323-5511
Fax: (604) 323-5555
www.langara.bc.ca

Langara College has a proud tradition of success, delivering quality arts and science university transfer courses, career programs and continuing studies programs to students in Greater Vancouver and beyond. Langara has built a reputation for teaching excellence during its 30 years of operation, first as a campus of another community college and, since April 1994, as a separate, independent college. Over 75 per cent of our 7,350 students are registered in first and second year university transfer arts & science programs. The 31 career programs are market-driven, providing students with the skills to succeed in a rapidly changing marketplace. Students benefit from smaller class sizes, award-winning instructors and lower tuition fees than at local universities.

Malaspina University College
900 Fifth Street
Nanaimo, B.C. V9R 5S5
Tel: (250) 753-3245
Fax: (250) 755-8725
www.mala.bc.ca

In 1989, Malaspina was designated a university college and began offering selected undergraduate university degree programs. The main campus is in Nanaimo on Vancouver Island, with regional campuses in Duncan, Powell River and the Parksville/Qualicum area.

Malaspina offers students the opportunity to select from a wide range of Upgrading, Vocational, Career/Technology, and University Degree programs. As well, students may access many services related to career planning, course selection, etc.

Nicola Valley Institute of Technology
Box 399
Merritt B.C. V1K 1B8
Tel.: (250) 378-3300
Fax: (250) 378-3332
www.nvit.bc.ca

Nicola Valley Institute of Technology (NVIT) was formed in 1983 and has grown since then from 12 students in one program to 144 full time and 29 part time students enroled at its Merritt campus as of the 1998/99 school year. Roughly 95 per cent of the student population are First Nation's people.

NVIT's mission is to provide high-quality post-secondary education relevant to the diverse and evolving needs of First Nation's communities in an environment that fosters students success. As a public post-secondary institution, NVIT grants fully accredited certificates, diplomas and associate degrees in its own name. Several NVIT programs ladder into degree programs at the university level.

The student services department at NVIT offers, academic, personal, spiritual and special needs counseling for all students. These services are provided by qualified professionals counselors as well as by a group of resident Elders.

North Island College
2300 Ryan Road
Courtenay, B.C. V9N 8N6
Tel: (250) 334-5000
Fax: (250) 334-5018
www.nic.bc.ca

Founded in 1975, North Island College serves a region of approximately 80,000 square kilometres and includes Northern Vancouver Island and the mainland coast from Desolation Sound to Swindle Island.

The College manages this region through three campuses and thirteen centres. Campuses are located in Campbell River, the Comox Valley, and Port Alberni, and Port Hardy, while centres are situated throughout the entire college region. Students may take advantage of a broad range of learning opportunities which include: college preparatory programs, academic/university studies programs, career/technical/vocational and trades training programs. A variety of class delivery options are available including classroom based instruction, open/distance courses, interactive television and workplace based training.

Northern Lights College
11401 - 8th Street
Dawson Creek, B.C. V1G 4G2
Tel: (250) 782-5251
Fax: (250) 782-5233
www.nlc.bc.ca

Northern Lights College was established in 1975. The region served by the College exceeds 308,000 square kilometres, more than three times the size of the next-largest college region.

The College operates eight campuses and learning centres, situated in Atlin, Chetwynd, Dawson Creek, Dease Lake, Fort Nelson, Fort St. John, Hudson s Hope and Tumbler Ridge. Students may choose from a wide range of academic/university transfer, adult basic education, career, vocational, and trade programs. As well, the College provides strong support for students in career and education planning.

Northwest Community College
5331 McConnell Ave.
Terrace B.C. V86 4X2
Tel: (250) 635-6511
Fax: (250) 635-3511
www.nwcc.bc.ca

Northwest Community College was first established in 1975 at the site of the B.C. Vocational School in Terrace, British Columbia. There are now six full-service campuses and an additional four partnership campuses located throughout the region, in Masset, Queen Charlotte City, Prince Rupert, Stewart, Terrace, Nass Valley, Kitimat, Hazleton, Smithers and Houston.

As a comprehensive community college, a wide selection of education and training is available — basic education, career, technical, vocational, trades, and university transfer programs as well as continuing education and community interest courses. An extensive community-based system of learning resource centres, student access and student success services ensure that individual students are supported in their studies. Part-time and extension programming is designed on an as-needed basis to fulfill the training requirements of business and industry.

That Northwest Community College is one of the few remaining B.C. colleges that still has the word "community" in its name is by design. The College's philosophy reflects the commonly-held value that programs and services are there for the benefit of the communities served and that all citizens have access to educational opportunities where they live and work.

Okanagan University College
3333 College Way
Kelowna, B.C. V1V 1V7
Tel: (250) 762-5445
Fax: (250) 862-5466
www.ouc.bc.ca

Okanagan University College was established in 1965 to serve the needs of residents in a 37,750 square-kilometre area from Osoyoos and Princeton in the south and west to Mica Creek and Revelstoke in the north and east. In 1989, the college began offering third-and fourth-year university courses. To reflect the new mandate, the name was changed to Okanagan University College from Okanagan College in 1992. In 1998, OUC conferred its own BA, BFA, BSc, and BSN degrees.

Okanagan University College includes campuses in Kelowna (KLO and North Kelowna), Salmon Arm, Vernon, and Penticton. Additional learning opportunities are available through programs and facilities in Revelstoke, Salmon Arm, Armstrong, Vernon, Kelowna, Summerland, Penticton, Oliver and Princeton. These various learning centres offer a broad range of basic education, academic (including university degree programs), career, technology, vocational and trades training programs.

Open Learning Agency
Including **B.C. Open University**
4355 Mathissi Place
Burnaby, B.C. V5G 4S8
Tel: (604) 431-3300
or: 1-800-663-9711
Fax: (604) 431-3381
www.ola.bc.ca/

Open College (OC) and Open University (OU), Divisions of the Open Learning Agency (OLA), emphasize quality, flexibility, and choice in post-secondary learning. Working with OLA's other divisions (Knowledge Network, Open School and Workplace Training Systems) and services (the Canadian Learning Bank and the International Credential Evaluation Service) they provide a unique package of open learning opportunities throughout B.C. and beyond.

OC and OU are fully accredited public institutions. Since 1978, they have provided distance and community-based education via supported print, audio, video, and computer technologies. Both OC and OU offer year-round registration, flexible course scheduling, credit evaluation and transfer services, educational planning assistance, and ongoing tutor support.

Together, OC and OU offer 250 credit courses, 14 certificate and diploma programs and 22 degree programs in Arts and Science, Business and Administrative Studies, Health, Human Services, Technology, and Tourism. Consortium partners UBC, SFU, and UVic deliver another 250 courses. These educational partnerships and other cooperative arrangements with colleges, institutes, universities, and professional associations provide students with even greater choice in how, when and where they learn.

Royal Roads University
2005 Sooke Road.
Victoria, B.C. V9B 5Y2
Tel: (250) 391-2505
or: 1-800-788-0828
Fax: (250) 391-2522
www.royalroads.ca

Royal Roads University is an applied University committed to delivering market-relevant programs tailored to the needs of today's working professionals. In order to accommodate the demands of career and personal lifestyle, their Masters programs are offered using a unique combination of short on-campus residencies and distance learning; while our undergraduate programs combine years 3 and 4 of a degree into an intensive 12 month cycle. Four themes form the foundation of Royal Roads University - sustainable development, entrepreneurship, empowering leadership, and conflict analysis and management.

Selkirk College
P.O. Box 1200
301 Frank Beinder Way
Castlegar, B.C. V1N 3J1
Tel: (250) 365-7292
Fax: (250) 365-6568
www.selkirk.bc.ca

Selkirk College was established in 1966, the only regional college to be established by public referendum. From three main campuses in Castlegar, Nelson and Trail and from local learning centres in Grand forks, Midway, Nakusp, Kaslo and Crescent Valley, Selkirk College delivers a wide range of academic, career/technical and vocational courses and programs to a vast college region. The quality education delivered by Selkirk college has attracted candidates nation-wide for programs such as Aviation, Forestry, Ski Resort Management, Golf Club Management, and Medical Transcriptionist. Many options exist to allow students to begin studies at Selkirk College then ladder into advanced diploma or degree completion programs offered at provincial universities. Selkirk College is proud to record above average results on student outcomes and student satisfaction surveys.

Simon Fraser University
SFU Registrar
Burnaby, B.C. V5A 1S6
Tel: (604) 291-3224
Fax: (604) 291-4969
www.sfu.ca

For three consecutive years, *Maclean's* magazine has ranked Simon Fraser University as Canada's best comprehensive university. Excellent faculty and first-rate students are key factors in this success. World-famous for its stunning architecture, the university s main campus is located atop Burnaby Mountain in suburban Vancouver. Harbour Centre, a satellite campus, operates in the heart of downtown Vancouver.

SFU serves 23,000 graduate and undergraduate students through five faculties (applied science, arts, education, business administration and science) and continuing studies. Operating year-round through a unique trimester system, SFU is well-known for its popular co-operative education option and numerous innovative programs including criminology, engineering science, contemporary arts, environmental studies, teacher education and business administration.

The Technical University of British Columbia
1063 Surrey Place Mall
Surrey, B.C. V3T 2W1
Tel: (604) 586-6000
Fax: (604) 586-6003
www.techbc.ca

The Technical University of British Columbia (TechBC) offers innovative new programs in sync with the needs and directions of our knowledge-driven economy. With its campus in Surrey City Centre, TechBC launched its initial undergraduate programs in September 1999 and has received approval to launch its graduate programs. TechBC's program areas include Information Technology, Management and Technology, and Interactive Arts. All programs feature both on-line and on-campus components, providing students with maximum flexibility and valuable experience. Students are encouraged to contact TechBC directly about specific programs. TechBC also has a strong applied research mandate and is developing corporate education programs.

The University of British Columbia
2016 - 1874 East Mall
Vancouver, B.C. V6T 1Z1
Tel: (604) 822-3014
Fax: (604) 822-3599
www.ubc.ca

The University of British Columbia is one of Canada's leading teaching and research institutions. Established in 1908, it is a publicly supported, comprehensive university comprising 12 faculties, nine schools, and 12 centres and institutes. The university aspires to be the best university in Canada and one of the world's finest public universities.

The current student population comprises both Canadian and international students of the highest calibre: more than 26,000 undergraduates and 6,400 graduate students. UBC offers its students an intellectually challenging education that takes advantage of the university s unique social and cultural make-up, geographical location, and research environment, and that prepares them to become citizens of the 21st century through programs that are international in scope, interactive in process, and interdisciplinary in context and approach.

University College of the Cariboo
900 McGill Road,
P.O. Box 3010,
Kamloops, B.C. V2C 5N3
Tel: (250) 828-5000
Fax: (250) 828-5159
www.cariboo.bc.ca

The University College of the Cariboo (UCC) in Kamloops is both a University and a College. As a University, UCC now offers 38 different degree choices, including Majors in 11 undergraduate degree programs, while as a College, UCC offers over 50 different one- and two-year Certificates and Diplomas. Many UCC programs are unique in B.C., and some are even unique in Canada. Unlike a traditional university, UCC is creating "ladders" which allow graduates of some college Diplomas to directly enter upper level university study in some UCC degrees.

The main UCC campus is located on the south slope of Kamloops, in the middle of city and close to all amenities. UCC also offers a wide range of university courses and college programs in Williams Lake, and provides access to many other interior residents through Education & Training Centres in Merritt, 100 Mile House, Clearwater, Lillooet and Ashcroft, and community offices in Barriere, Chase, Clinton, Lytton and Logan Lake.

University College of the Fraser Valley
33844 King Road
Abbotsford, B.C. V2S 7M9
Tel: (604) 853-7441
Fax: (604) 853-9990
www.ucfv.bc.ca

The University College of the Fraser Valley is a major adult educational resource for the communities of the Fraser Valley. UCFV provides a wide range of more than 70 academic, applied, trades technical access and continuing education programs. These include bachelor's degree, diploma and certificate programs.

UCFV is learner-centered, and has a special interest in integrated studies and in laddering opportunities from lower to upper level programs. UCFV takes pride in its many partnerships with business, community and other educational organizations. These include the Career Technical Centre in Abbotsford, and Heritage Park Centre in Mission. UCFV has campuses in Abbotsford, Chilliwack and Mission, a regional centre in Hope and an information centre in Agassiz. Each year more than 6,000 students enrol in credit programs and more than 17,000 attend continuing education courses.

University of Northern British Columbia
3333 University Way
Prince George, B.C. V2N 4Z9
Tel: (250) 960-5555
Fax: (250) 960-6330
www.unbc.ca

The University of Northern British Columbia has a particular focus on the social and economic issues of the North, and students have the opportunity to benefit from personal contact with professors. The Prince George campus opened in 1994. There are currently about 3,200 students registered in one of about 40 degree programs at the Bachelors, Masters, and Doctoral level. The campus provides ready access to a living laboratory for the study of important environmental and community issues.

University of Victoria
P.O. Box 1700
STN CSC
Victoria, B.C. V8W 2Y2
Tel: (250) 721-7211
Fax: (250) 721-7212
www.uvic.ca

One of Canada's leading comprehensive universities, the University of Victoria offers its 17,000 undergraduate and graduate students wide-ranging degree programs that respond to the needs of today's ever-changing world. UVic's compact, heavily-treed campus provides a friendly community environment for students. The University's faculties of business, education, engineering, fine arts, graduate studies, human and social development, humanities, law, science and social sciences offer an interdisciplinary approach to learning, providing students access to leading researchers and a challenging and engaging atmosphere for study.

Vancouver Community College
1155 East Broadway
Box 24620, Station F
Vancouver, B.C. V5N 5T9
Tel: (604) 871-7000
Fax: (604) 871-7100
www.vcc.bc.ca

Vancouver Community College serves one of the fastest growing communities in Canada, providing students with the skills to adapt to a changing society and a changing economy. VCC is made up of two main campuses: City Centre, specializing in preparing students for careers in hospitality, health, business and applied arts and technology; and King Edward Campus, offering programs in adult basic education, adult special education, automotive technology, music, and western Canada s largest English as a Second Language program. The college also provides a wide range of student services, including educational advising, career and personal counseling, financial aid information, and services for students with disabilities.

ALPHABETICAL INDEX OF OCCUPATIONS

A

accommodation officer ... 69
accompanist ... 312
account executive - wholesale trade ... 370
account information clerk ... 110
accountant ... 46
accounting bookkeeper ... 81
accounting clerk ... 105
accounts payable clerk ... 105
accounts receivable clerk ... 105
acid truck driver ... 533
acoustical ceiling installer ... 459
acoustics engineer ... 132
acoustics physicist ... 121
acrobat ... 328
acting teacher ... 313
actuarial clerk ... 105
actuary ... 146
acupuncturist ... 241
addictions counsellor ... 276
addictions worker ... 290
adhesives engineer ... 132
adjuster ... 86
administrative assistant ... 99
administrative clerk ... 108
administrative dietitian ... 215
administrative officers ... 62
administrative services coordinator ... 62
administrative support clerks ... 108
adult education teacher, secondary school ... 268
advertising account executive ... 59
advertising clerk ... 110
advertising copywriter ... 305
advertising designer ... 331
advertising director ... 42
advertising editor ... 305
aerial photographer ... 323
aerial spraying assistant ... 512
aerobics instructor ... 337
aerodynamicist ... 121
aerodynamics engineer ... 137
aerological technician ... 155
aeronautical ... 137
aeronautical technologist ... 168
aerospace engineers ... 137
agricultural chemist ... 121
agricultural economist ... 283
agricultural engineer ... 137
agricultural quarantine inspector ... 184
agricultural technician ... 158
agricultural technologist ... 158
agriculture contractor ... 525
air defence technician ... 389
air quality meteorologist ... 122
air traffic control chief ... 187
air traffic controller ... 187
air-cooled engine mechanic ... 474
aircraft design engineer ... 137
aircraft electrical technician ... 178
aircraft electrician ... 178
aircraft engine fitter ... 467
aircraft groomer ... 502
aircraft inspector ... 467
aircraft instrument mechanic ... 178
aircraft instrument, electrical and avionics mechanics, technicians and inspectors ... 178
aircraft maintenance engineer ... 467
aircraft maintenance engineer, avionics ... 178
aircraft mechanic ... 467
aircraft mechanic helper ... 512
aircraft mechanic, engine overhaul ... 467
aircraft sales representative ... 346
aircraft systems inspector ... 467
aircraft upholsterer ... 478
airframe assembler ... 575
airline baggage agent ... 378
airline cargo agent ... 378
airline sales and service agents ... 377
airport firefighter ... 363
airport limousine driver ... 495
airport ramp attendant ... 502
airport security guard ... 415
alarm investigator ... 389
alarm system technician ... 174
all-terrain vehicle repairer ... 474
alterations dressmaker ... 478
ambulance attendant ... 247
ambulance attendants and other paramedical occupations ... 247
amusement park attendant ... 420
amusement ride operator ... 420
analytical chemist ... 121
analytical technician, chemical ... 154
anatomical pathologist ... 194
anatomist ... 125
anesthetist ... 194
animal care worker ... 402
animal control officer ... 389
animal control trapper ... 505
animal health technologist ... 227
animator ... 331
animator, recreation and sport ... 337

announcer ... 328
announcers and other performers ... 328
answering service operator ... 100
anthropologist ... 283
antique appraiser ... 90
antique dealer ... 42
appliance service technician ... 474
application programmer ... 150
applications analyst - computer systems ... 148
appraisal forester ... 128
appraiser ... 90
apprentice aggregate plant operator ... 555
apprentice air compressor and pneumatic tool mechanic ... 505
apprentice aircraft maintenance technician ... 467
apprentice aircraft painter ... 579
apprentice aircraft structural technician ... 467
apprentice antique furniture restorer and finisher ... 578
apprentice appliance service technician ... 474
apprentice arboriculturist, urban forestry ... 165
apprentice asphalt plant operator ... 498
apprentice automatic transmission service technician ... 470
apprentice automotive electrical and tune-up service technician ... 470
apprentice automotive electrical technician ... 470
apprentice automotive glass technician ... 462
apprentice automotive machinist ... 433
apprentice automotive painting and refinishing technician ... 471
apprentice automotive partsperson ... 116
apprentice automotive radiator manufacturer and repairer ... 576
apprentice automotive refinishing prep technician ... 471
apprentice automotive service technician ... 470
apprentice automotive upholsterer ... 478
apprentice baker ... 359
apprentice barber ... 365
apprentice boatbuilder ... 578
apprentice cable splicer ... 441
apprentice cable splitter ... 443
apprentice carpenter ... 455
apprentice cement finisher ... 459
apprentice cladder ... 505
apprentice community antenna television technician ... 436, 447
apprentice concrete plant operator ... 556
apprentice construction boilermaker ... 453
apprentice cook ... 355
apprentice diesel engine machinist ... 433
apprentice diesel engine mechanic ... 466
apprentice diesel fuel injection mechanic ... 466
apprentice domestic/commercial gas fitter ... 449
apprentice dressmaker and designer ... 478
apprentice drywall finisher ... 459
apprentice electrical rewind mechanic ... 576
apprentice electrician ... 435, 438 - 439
apprentice electronics communication technician ... 445
apprentice electronics technician ... 172
apprentice electronics technician, consumer products ... 174
apprentice electro-plater ... 579
apprentice elevator mechanic ... 467
apprentice embalmer ... 368
apprentice farm equipment mechanic ... 466
apprentice floor covering installer ... 463
apprentice food and beverage server ... 385
apprentice forklift mechanic ... 466
apprentice funeral director ... 368
apprentice glazier ... 462
apprentice graphic arts, artist (mechanical and creative) ... 331
apprentice graphic arts, bookbinder ... 572
apprentice graphic arts, compositor ... 102
apprentice graphic arts, electronic pre-press ... 572
apprentice graphic arts, lithographic press feeder ... 586
apprentice graphic arts, lithographic press operator (web or sheet feed) ... 572
apprentice graphic arts, lithographic pressperson (web, sheet feed, rotary and gravure) ... 572
apprentice graphic arts, platemaker ... 572
apprentice graphic arts, printer ... 572
apprentice graphic arts, stripper and assembler ... 572
apprentice hairdresser ... 365
apprentice hardwood floorlayer ... 463
apprentice heat and frost insulator ... 463
apprentice heavy duty equipment mechanic ... 466
apprentice hydraulic crane operator ... 487
apprentice hydraulic service mechanic ... 467
apprentice inboard/outboard mechanic ... 474
apprentice industrial engines and equipment partsperson ... 372
apprentice industrial gas fitter ... 449
apprentice industrial instrument mechanic ... 176
apprentice industrial warehouseperson ... 508
apprentice ironworker ... 453
apprentice jeweller and goldsmith ... 478
apprentice joiner ... 455
apprentice landscape horticulturist ... 165
apprentice lather (interior systems mechanic) ... 459
apprentice lineman/woman, telecommunications ... 443
apprentice logbuilder ... 455
apprentice lumber manufacturing industry, benchperson ... 561
apprentice lumber manufacturing industry, circular sawfiler ... 561
apprentice lumber manufacturing industry, sawfitter ... 561
apprentice machine fitter ... 467, 478
apprentice machinist ... 433
apprentice machinist (mould shop) ... 455
apprentice marine engine mechanic ... 466
apprentice marine engineer ... 137
apprentice marine repair technician ... 474
apprentice mason ... 459

apprentice master glass blower ... 332
apprentice meat cutter ... 357
apprentice metal fabricator ... 453
apprentice meter technician ... 505
apprentice millwright ... 466
apprentice mobile crane operator, construction industry ... 487
apprentice motion picture and theatre, assistant location manager ... 323
apprentice motion picture and theatre, costumer (film) ... 323
apprentice motion picture and theatre, entertainment rigger ... 324
apprentice motion picture and theatre, first assistant make-up artist ... 323
apprentice motion picture and theatre, grip ... 324
apprentice motion picture and theatre, lighting technician (stage) ... 323
apprentice motion picture and theatre, script supervisor ... 323
apprentice motion picture and theatre, second assistant picture editor ... 305
apprentice motion picture and theatre, set dresser ... 323
apprentice motion picture and theatre, third assistant director ... 312
apprentice motorcycle mechanic ... 474
apprentice mould maker ... 433, 556
apprentice moulder and coremaker ... 555
apprentice office machine repairer ... 174
apprentice oil burner mechanic (residential) ... 474
apprentice operator/area dispatcher ... 482
apprentice outdoor power equipment technician ... 474
apprentice painter and decorator ... 463
apprentice patternmaker ... 433
apprentice piledriver and bridge worker ... 487, 498
apprentice planermill maintenance technician 1 ... 561
apprentice planermill maintenance technician 2 ... 561
apprentice plasterer ... 459
apprentice plumber ... 449
apprentice powerline technician ... 441
apprentice production horticulturist ... 526
apprentice railcar mechanic ... 467
apprentice refrigeration mechanic ... 466
apprentice residential steep roofer ... 462
apprentice roofer ... 462
apprentice security alarm installer ... 174
apprentice sheet metal worker ... 453
apprentice sheet metal worker, manufacturing ... 453
apprentice shipfitter ... 453
apprentice shipwright ... 455
apprentice sign painter ... 323
apprentice springmaker ... 582
apprentice sprinkler system installer ... 449
apprentice standard transmission repairer ... 470
apprentice steamfitter, pipefitter ... 449
apprentice telecontrol technologist ... 445
apprentice tilesetter ... 459
apprentice tire repairer ... 505
apprentice tool and die maker ... 433
apprentice tower crane operator ... 487
apprentice trailer mechanic ... 470
apprentice transportation refrigeration mechanic ... 466
apprentice truck body builder ... 576
apprentice upholsterer ... 478
apprentice utility arborist ... 165
apprentice wheel alignment and brake service technician ... 470
aquaculture diver ... 491
aquaculture operator ... 526
aquaculture technician ... 158
arborist ... 165
archaeologist ... 283
architect, landscape ... 142
architects, urban planners and land surveyors ... 140
architectural manager ... 41
architectural standards specialist ... 141
architectural technologists and technicians ... 180
archive assistant ... 319
armoured car guard ... 415
armoured vehicle crew member ... 389
aromatherapist ... 241
art appraiser ... 90
art director ... 312, 332
art editor ... 305
art gallery manager ... 42
art instructor ... 313
art therapist ... 218
articling student ... 260
artillery soldier ... 389
artist ... 313
artistic director ... 312
arts and crafts leader ... 337
asphalt roofer ... 462
asphalt worker, road ... 512
assault pioneer ... 389
assayer ... 155
assembler and wirer, motors and generators ... 576
assembler, laundry and dry-cleaning ... 423
assembler, rubber good ... 558
assembly fitter ... 467
assembly machine setter - electrical equipment ... 576
assembly painter ... 579
assessor ... 90
assessors, valuators and appraisers ... 90
assistant buyer ... 352
assistant camera operator ... 323
assistant curator ... 300
assistant deputy minister ... 38
assistant director ... 323
assistant driller ... 519
assistant executive housekeeper ... 343
assistant professor, botany ... 263

associate editor 305
associate professor, linguistics 263
astrologer 402
astrophysicist 121
athletes, coaches, referees and related occupations 336
athletic judge 337
athletic therapist 218
athletics coach 337
atmospheric physicist 122
attache 283
attorney 260
audio equipment salesperson 372
audio prosthetist 251
audio technician 323
audiologist 218
audiometric technician 251
audio-video service technician 174
audiovisual technician 323
audit clerk 105
auto glass glazier 462
autobody mechanic 471
autobody repairer 471
automobile salesperson 372
automotive body technician 471
automotive collision repair technician 471
automotive engineer 132
automotive mechanic 470
automotive partsperson 116
automotive service technician 470
automotive upholsterer 478
auxiliary plant operator 482
avalanche controller 155
aviation safety inspector 184
avionics engineer 132
avionics inspector 178
avionics technician 178

B

babysitter 400
babysitters, nannies and parents' helpers 399
back tender 561
back tender, paper machine 552
backfiller 532
backhoe operator 498
bacteriologist 125
bacteriology technician 158
bag clerk 407
bag machine operator 558
baggage handler 502
baggage tracer, airline 378
bagger, laundry and dry-cleaning 423
bailiff 389
bakers 359
bakery supervisor 359
ballet dancer 313
ballet teacher 312
ballistics examiner 122
ballroom dancing teacher 313
banbury operator 558
band leader 312
band saw operator - woodworking 582
bank clerk 105
bank manager 41
bank teller 105
banquet server 385
barber 365
barkeeper 385
barrister 260
bartender helper 412
baseball player 337
battery repairer, production line 576
beater engineer 552
beater operator - pulp and paper 561
beauty salon attendant 423
beauty treatment operator 402
bellhop 420
bench fitter mechanic 575
bending machine operator 582
benefits officer 105
bereavement counsellor 276
bibliographer 300
bicycle repairer 505
bill collector 105
bingo hall attendant 420
biochemical engineer 132
biochemist 121
biochemistry technologist 154
biological laboratory technologist 158
biological technologists and technicians 157
biologist 125
biologists and related scientists 125
biology teacher, high school 268
biomedical engineer 137
biophysicist 121
biostatistician 146
biotechnical engineer 132
blacksmith 453
blast furnace operator 552
blaster, surface mining 489
blaster, underground mining 519
bleach plant operator 552
bleacher plant operator - pulp and paper 561
blender - chemical processing 558
blender operator 533
blood donor clinic assistant 410
blow moulding machine operator 558
boat assembler 578
boat inspector 578
body repairer, motor vehicle 471
bodyguard 415
boiler and pipe insulator 463

boiler operator 482
boilermaker 453
bond dealer 52
book binding machinery operator 572
book reviewer 305
bookkeepers 81
boom boat operator 502
boom truck crane operator 486
bootmaker 478
botanical technician 158
botanist 125
bottle machine operator 555
bottling machine operator 569
bouncer 415
bowling alley attendant 420
box maker operator 561
box office cashier 405
boxer 337
brakeman/woman 484
brakeworker 484
brewery worker 586
bricklayer 459
bricklayer helper 511
brickmason 459
bridge crane operator 486
bridge design technician 168
bridge engineer 132
broadcast engineer 323
broadcast journalist 305
broadcast transmitter operator 323
broadcaster 328
brush making machine operator 582
bucker 535
building caretaker 417
building cleaning supervisor 343
building exterior cleaner 417
building inspector 184
building manager 69
building materials technician 168
building space planner 332
built-up roofer 462
bulldozer operator 498
bus boy/girl 412
bus driver 495
bus inspector 431
bus mechanic 470
business development officer 283
business management consultant 59
business methods analyst 59
business programmer 151
business systems specialist 148
business valuator 90
busker 328
butcher, retail and wholesale (older term) 357
butchers and meat cutters, retail and wholesale 357
butt-n-top feller operator 522
buyer - retail and wholesale 352
by-law clerk 108
by-law enforcement officer 389

C
cabinetmaker 455
cable ferry operator 502
cable installer helper 512
cable installer, electrical power 441
cable repairer, telecommunications 443
cable splicer, electrical power 441
cable television service and maintenance technicians 447
cable television servicer 447
cable yarding operator 522
cable yarding system operator 522
cafeteria cashier 405
cafeteria counter attendant 412
cafeteria supervisor, food services 343
cage manager 52
cage tender 532
caleche driver 382
calender operator 558
camera crane operator 323
camera operator 323
camera operator, graphic arts 572
camp coordinator 283
camp counsellor 337
camp ground supervisor 343
campground attendant 420
can forming machine operator 582
cannery labourer 586
canning machine operator 569
canoeing guide 382
canteen supervisor 343
canvasser - retail 407
capsule machine operator 558
captain food server 385
captain, fishing vessel 529
car checker, railway 512
car jockey 423
car mechanic 470
car rental agent 372
card dealer 420
cardiologist 194
cardiovascular and thoracic surgeon 194
cardiovascular perfusionist 227
care aide 395
career counsellor 293
cargo attendant 502
cargo broker 92
carman/woman 467
carpenter 455
carpenter's helper 511
carpenters and cabinetmakers 455
carpet cleaner 417

carpet cleaning supervisor ... 343
carpet layer ... 463
carton forming machine operator ... 561
carver ... 332
carworker ... 467
case manager, corrections ... 278
cashiers ... 405
casting agent ... 323
casting helper ... 585
casting machine operator ... 555
cataloguer ... 300
catering supervisor ... 343
CATV technician ... 447
CEGEP teacher ... 265
ceiling installer ... 459
cell biologist ... 125
cellular telephone technician ... 445
cement finisher ... 459
cement mason ... 459
cementer ... 533
cemetery foreman/woman ... 526
census enumerator ... 111
central control and process operators in manufacturing and processing ... 552
central control caster ... 552
central control room operator ... 552
central office technician ... 445
central supply aide ... 410
ceramic dental caster ... 232
ceramic dental moulder ... 232
ceramic mould maker ... 555
ceramic tile installer ... 459
ceramics engineer ... 137
certified aircraft technician ... 467
certified dental assistant, level II ... 254
certified general accountant (CGA) ... 46
certified management accountant (CMA) ... 46
chainsaw and skidder operators ... 535
chainsaw operator ... 535
chairperson ... 38
chairperson, food sciences department ... 263
charter boat operator ... 502
chartered accountant (CA) ... 46
chartered financial analyst ... 49
chartered ship broker ... 92
chaser ... 522
chauffeur ... 495
check pilot ... 187
chef de cuisine ... 354
chef de partie ... 354
chefs and cooks ... 354
chemical analyst ... 154
chemical engineer, environmental ... 132
chemical engineering technician ... 154
chemical engineering technologist ... 154
chemical laboratory analyst ... 154
chemical process engineer ... 132
chemical process operator ... 552
chemical processing cleaner: ... 585
chemical research technician ... 154
chemical services operator ... 533
chemical technician ... 154
chemical technologist ... 154
chief administrative officer ... 38
chief architect ... 141
chief archivist ... 300
chief buyer ... 352
chief engineer officer ... 188
chief estimator - construction ... 168
chief executive officer (CEO) ... 38
chief financial officer (CFO) ... 38
chief flying instructor ... 187
chief librarian ... 42
chief of medical staff ... 42
chief operating officer ... 38
chief pilot ... 187
chief train dispatcher ... 188
chief wine steward ... 385
chief, economic analysis ... 42
child welfare policy analyst ... 283
child-care worker assistant ... 393
child-care worker, day care ... 393
chimney cleaner ... 417
Chinese medical practitioner ... 241
chiropodist ... 210
chiropractic aide ... 410
chiropractic doctor ... 207
chiropractors ... 207
choir director ... 312
chokerman/woman ... 546
Christmas tree farm operator ... 525
church organist ... 312
chute blaster ... 519
cinematographer ... 312
circuit board assembler ... 575
circular saw operator ... 561
circulation assistant ... 319
circulation clerk ... 110
circus performer ... 328
city administrator ... 38
city councillor ... 38
city medical health officer ... 42
city planner ... 142
civil engineering technician ... 168
civil engineering technologist ... 168
civil, mechanical, electrical and chemical engineers ... 130
claims clerk ... 105
claims examiner ... 86
classification officer ... 57
classification officer, correctional institution ... 278
clay press operator ... 556

clay products grader 556
cleaners 416, 417
cleaning machine operator 423
clearing saw operator 538
clerical occupations, general office skills 99
clerk-of-the-course 337
climate data processor 155
climate service specialist 155
climate service technician 155
climatologist 122
climbing crane operator 486
clinic assistant 410
clinical chemist 121
clinical dietitian 215
clinical engineer 137
clinical immunology technologist 227
clinical laboratory helper 410
clinical occupational therapy specialist 218
clinical perfusionist 227
clinical pharmacist 213
clinical psychologist 271
cloakroom attendant 423
clock repairer 478
clothing buyer 352
clothing cutter 567
clothing designer 332
clothing salesperson 372
clown 328
coating machine operator 579
coatings chemist 121
cocktail server 385
coil winder and repairer 474
coiled tubing operator 533
collection officer 105
college and other vocational instructors 265
college department chairperson, trade programs 265
college teacher 265
colour consultant, fashion 402
columnist 305
comedian 313
commerce teacher, secondary school 268
commercial air-conditioning mechanic 466
commercial art instructor 265
commercial artist 331
commercial divers 491
commercial law clerk 288
commercial photographer 323
commercial real estate agent 350
commercial transport inspector 389
commercial transport vehicle mechanic 470
commercial underwriter 88
commission chairperson 38
commissionaire 415
commissioned land surveyor 142
commissioned officer, armed forces 42
commissioner of marriages 77
commissioner of oaths 77
committee clerk 65
commodities investment representative 52
communication equipment sales representative 346
communication technician 445
communication technician, construction 443
communications officer 305
communications specialist 306
communications technologist 172
community and social service workers 290
community and urban planner 142
community college teacher 265
community development officer 283
community development worker 290
community dietitian 215
community health nurse 222
community nutritionist 215
community occupational therapist 218
community pharmacist 213
community relations officer 361
community service worker 290
companion 395
company trainer 265
complaint clerk 110
computer 137
computer analyst 148
computer consultant 148
computer cutter 567
computer graphics specialist 148
computer operator 33 - 36, 102
computer programmers 150
computer sales supervisor 343
computer salesperson - retail 372
computer service technician 174
computer systems analysts 147
computer systems manager 41
computer systems sales representative 346
computer tape librarian 102
computer training instructor 265
conciliator 57
concrete block maker 556
concrete finisher 459
concrete mixer helper 511
conductor 484
conference and event planners 74
conference interpreter 306
conference planner 74
conference services manager 74
conservation and fishery officers 163
conservation officer 163
conservation technician 320
conservation technician - forestry 161
constable 361
construction blaster 489
construction boilermaker 453
construction crane operator 486

construction diver 491
construction driller 489
construction electrician 435
construction engineer 132
construction equipment mechanic 466
construction equipment sales representative 346
construction helper 511
construction inspector 184
construction labourer 511
construction lineman/woman, electrical power line 441
construction managers 42
construction millwright 466
construction painter 463
construction technician, CATV 443
construction technologist 168
construction trades helper 511
consultant dietitian 215
consultant, drug and alcohol abuse 283
consultant, health care 283
consultant, human resources 57
consultant, management information systems (mis) 148
consultant, mental health programs 283
consultant, organizational analysis 59
consulting architect 141
consulting forester 128
consumer advisor 283
contact lens fitter 238
contact lens technician 238
contract management officer 72
contracting officer 72
contractor 428
contractors and supervisors, trades and related workers 428
contractors, operators and supervisors in agriculture, horticulture and aquaculture 525
control panel assembler 576
control systems engineer 132
control tower operator, railway 501
controller 41
control-room operator 569
convention coordinator 74
conveyor cleaner - pulp and paper 586
conveyor operator 532
cook's helper 412
coordinator of social work 273
coordinator, office services 62
coordinator, special education 283
co-pilot 187
coppersmith 453
copy editor 305
copy marker 102
copy stylist 323
copywriter 305
corporate chef 354
corporate counsel 260
corporate paralegal 288
corporate secretary 65
corporate security officer 389
correctional facility guard 389
correctional service officer 389
correspondence clerk 110
correspondent 305
corrosion engineer 137
corrugator operator 561
cosmetician 402
cosmologist 121
cost engineer 137
cost estimator - construction 168
costume attendant 323
costume designer 332
costume set supervisor 323
counter clerk - retail 372
counter services agent, airline 378
courier 113
courier service manager 41
court administrator 77
court clerk 77, 108
court clerk supervisor 77
court interpreter 306
court manager 77
court officer 77
court officers and justices of the peace 76
court recorder 95
court registrar 77
court reporter 95
court stenographer 95
courtesy desk clerk 111
couturier 332
craft instructor 332
crane operator 486
crane operators 486
creative and performing artists 311
creative designers and craftspersons 330
creative non-fiction writer 305
credit and collection clerk 105
credit clerk 105
credit manager 41
credit officer 83
crew chief 428
crewman/woman, fishing vessel 544
crime prevention constable 361
crisis intervention worker 290
critical care nurse 222
crop farm labourer 546
crossing guard 415
crown attorney 260
crown prosecutor 260
cruising technician - forestry 161
crusher operator 532
curatorial assistant 319
cure operator 558
curriculum developer 283

curriculum planner 283
custodian 417
custom tailor 478
custom upholsterer 478
custom wood furniture maker 455
customer service agent, airline 378
customer service clerk 111
customer service representative 105
customs broker 92
customs clerk 108
customs inspector 79
customs officer 79
customs, ship and other brokers 92

D

dairy helper 586
dairy plant manager 42
dairy production manager 525
dairy production technician 540
dance instructor 312
dance therapist 218
dark room technician 572
data administrator 33 - 36
data centre manager 41
data control clerk 102
data entry clerk 102
data entry operator 102
data processor 102
database administrator 33 - 36
day-care supervisor 393
day-care worker 393
dean 42
deck officer, fishing vessel 529
deckhand 501, 544
delivery driver 495
delivery person, customer service 113
demographer 146
demolition worker 511
demonstrator - retail 407
dental assistant, level I 254
dental assistants 254
dental hygienist 236
dental hygienists and dental therapists 235
dental laboratory bench worker 232
dental technician 232
dental technician supervisor 232
dental technicians and laboratory bench workers 231
dental therapist 236
dentists 199
denture finisher 232
denture packer 232
denture technician 234
denture therapist 234
denture waxer 232
denturists 233, 234
denturologist 234
department head, dental hygienist program 265
department head, geography 263
department head, secondary school 268
department store clerk 372
department store manager 42
department store supervisor 343
deputy chief executive officer 39
deputy fire chief 42
deputy minister 38
deputy registrar 77
deputy sheriff 389
dermatologist 194
derrickman/woman 533
design engineer, electrical 132
design engineer, mechanical 132
desktop compositor 102
desktop publishing operator 102
detective 361
detention attendant 389
detention centre director 42
development economist 283
development geologist 122
developmental service worker 290
diamond driller, underground mining 519
die cutter 567
die setter 453
diesel mechanic helper 512
diesel mechanic, heavy equipment 466
diesel station operator 482
diesel technician 466
dietary cook 355
dietitians and nutritionists 215
digester cook 552
direct distributor - retail 407
directional drilling operator 519
director general 38
director of mining 42
director of nursing 42
director of photography 312
director of recreation 42
director of research, forestry 41
director, community centre 42
director, curriculum development 42
director, management information systems 41
director, school inspections 42
director, switching system 41
directory assistance operator 102
dishwasher 412
disk flange operator 582
disk jockey 328
dispatcher 116
dispatcher, bus 431
dispensing optician 238
distribution control operator 482
distribution design technologist, lines 172

distribution planning engineer, electrical ... 132
district forester ... 128
diving instructor ... 491
dock worker ... 508
doctor of chiropractic (DC) ... 207
doctor of optometry (OD) ... 205
documentation clerk ... 108
dog groomer ... 402
dog trainer ... 402
domestic refrigeration and air-conditioner servicer ... 474
door attendant ... 423
doorkeeper, hotel ... 420
door-to-door salesperson ... 407
downhole tool operator ... 519
drafting technologists and technicians ... 180
dragline crane operator ... 487
drama coach ... 313
drapery cleaner ... 423
dredging equipment operator ... 498
dress patternmaker ... 332
dressmaker ... 478
drift miner ... 519
drill operator - woodworking ... 582
drill stem tester ... 519
driller ... 519
driller, underground mining ... 519
drillers and blasters - surface mining, quarrying and construction ... 489
drilling engineer, oil and gas ... 137
drilling rig medic ... 247
driver salesperson ... 495
drop-in centre worker ... 290
druggist ... 213
dry-cleaner ... 423
drywall finisher ... 459
drywall sander ... 511
dude wrangler ... 382
dump truck driver ... 495
dyeing and finishing machine loader ... 586
dyer, laundry and dry-cleaning ... 423

E

early childhood educator assistant ... 393
early childhood educators and assistants ... 392
early childhood program staff ... 393
early childhood supervisor ... 393
eaves trough installer ... 505
ecologist ... 125
economic analyst ... 283
economic development officer ... 283
economist ... 283
economist, natural resources ... 283
edgerman/woman ... 561
editorial assistant ... 110
editors ... 305
education consultant ... 283
education policy officer ... 283
education program coordinator ... 283
education program officer ... 283
education researcher ... 283
educational audiologist ... 218
educational counsellor ... 268
educational resources assistant ... 398
elections officer ... 283
electric arc welder ... 582
electric line operator ... 519
electric motor repairer ... 474
electric power plant manager ... 42
electrical and electronics engineering technologists and technicians ... 171
electrical appliance servicer ... 474
electrical appliances assembler ... 576
electrical engineering technician or technologist ... 172
electrical power line and cable workers ... 441
electrical products labourer ... 586
electrician ... 436
electricians (construction and maintenance) ... 435
electricity sales representative ... 346
electrochemist ... 121
electroencephalographic (EEG) technologist ... 227
electrologist ... 402
electrologist technician ... 402
electrometallurgical engineer ... 137
electromyography (EMG) technologist ... 227
electroneurophysiology technologist ... 227
electronic data processing (EDP) analyst ... 148
electronic news gathering (ENG) camera operator ... 323
electronic service technician supervisor ... 174
electronic service technicians (household and business equipment) ... 173
electronics design technologist ... 172
electronics engineering technician or technologist ... 172
electronics inspector, missiles ... 178
electronics manufacturing technician or technologist ... 172
electronics technologist, physics department ... 172
electroplater operator ... 579
elemental medical and hospital assistants ... 409
elementary and secondary school teacher assistants ... 397
elementary school teacher ... 268
elementary school teacher, English as a second language ... 268
elementary school teacher, French as a second language ... 268
elevator constructor and mechanic ... 467
elevator inspector ... 184
elevator operator ... 423
embalmer ... 368
embroidery machine operator ... 564
embroidery patternmaker ... 332
embryologist ... 125

emergency medical assistant 247
employee relations officer 57
employment counsellors 292, 293
employment equity officer 57
employment insurance agent 79
endocrinologist 194
endodontist 199
energy conservation engineer 132
energy policy analyst 282
enforcement officer - forestry 161
engineer 484
engineer, chemical 132
engineer, computer integrated manufacturing 137
engineer, power generation 132
engineering department manager 41
engineering geologist 137
engineering physicist 137
engineering scientist 138
English as second language teacher, high school 268
English professor 263
English teacher, secondary school 268
environment planner 142
environmental chemist 121
environmental engineer 132
environmental geologist 122
environmental health inspector 184
environmental impact analyst 283
environmental issues lobbyist 282
equipment cleaners 511
equity trader 52
ergonomist 282
escalator repairer 467
essayist 305
estate agent 350
estate and trust administrator 55
estate secretary 95
esthetician 402
etiquette consultant 402
evaporator operator - chemical processing 558
event planner 74
examiner, credit unions 55
excavator operator 498
executive assistants 64, 65
executive director 38 - 39
executive secretary 65, 95
executive sous-chef 354
executive vice-president 39
experimental physicist 121
experimental psychologist 271
exploration geologist 122
express mail clerk 113
extension ranger - forestry 161
exterior cladder 505
exterminator, pests 505
extractive metallurgist 137

F

fabric designer 332
faceman/woman, coal mine 519
factory tour guide 382
faller 535
family counsellor 276
family court counsellor 276
family law paralegal 288
family physician 197
family service worker 290
family, marriage and other related counsellors 276
farm equipment mechanic 466
farm manger 525
farm owner/operator 525
farm supervisors and specialized
  livestock workers 525
farmer 525
fashion and wardrobe consultant 402
fashion designer 332
fast-food preparer 412
federal-provincial relations officer 283
feedlot foreman/woman 525
feller buncher operator 522
ferry terminal worker 502
ferryboat master 188
festival organizer 74
fibreglass boat assembler 578
field engineer 389
field operator - pulp and paper 561
field service technician, electronic products 174
figure skater 337
figure skating coach 337
figure skating judge 337
file clerk 100
fill foreman/woman 516
film camera operator 323
film editor 312
film printing machine operator 572
film processor 572
film technician 323
filmmaker 312
finance and insurance clerks 104
finance clerk 105
financial analyst 49
financial and investment analysts 49
financial assistance worker 290
financial auditor 46
financial auditors and accountants 46
financial consultant 49, 55
financial economist 283
financial investigator 55
financial management advisor/
  advanced financial planner 49
financial manager 41
financial planner 55

fine dining server 385
finisher 423
finishing carpenter 455
finishing machine operator 578
fire captain 363
fire insulator 463
fire prevention engineer 137
fire sprinkler fitter 449
fire suppression officer - forestry 161
firefighter 363
firefighter, shipboard 363
firefighters 363
first aid attendant 247
first cook 355
first mate, ship 187
first pressmand/woman 572
fish and wildlife officer 163
fish canning machine operator 569
fish cleaner and cutter 569
fish cutting machine operator 569
fish farm helper 546
fish hatchery manager 526
fish hatchery technician 158
fish plant labourer 586
fish tagger 546
fisher 529
fisheries analyst 283
fisheries technician 158
fisherman/woman 530
fishery officer 163
fishing guide 382
fishing vessel deckhands 544
fishing vessel masters and skippers
  and fishermen/women 529
fitness consultant 283
fitness instructor 337
fitness leader 337
fitness supervisor 283
fitter 478
fitter and assembler, AC and DC motors 576
fixer, textile machinery 466
fixture assembler 578
flagman/woman 512
flatbed truck driver 495
flight crew scheduler 116
flight dispatcher 187
flight service director 376
flight service specialist 187
floor covering installer 463
floor director 323
floor investment representative,
  commodity exchange 52
flower grower 525
fluid mechanics engineer 132
flyer distributor 113
folkloric dancer 312
food bacteriological technician 158
food buyer 352
food chemist 121
food counter attendant 412
food counter attendants and kitchen helpers 411
food damage inspector 184
food delivery driver 495
food preparer 412
food processing engineer 137
food product technologists 158
food products sales representative 370
food service helper 412
food technologist 154
foot specialist 210
football coach 337
football player 337
football scout 337
foreign service officer 283
foreman/woman 428
foreman/woman - laundry and dry cleaning 343
foreman/woman, truck fleet 431
forensic photographer 323
forest engineer 128
forest fire fighter 538
forest fire technician 161
forest nursery worker 542
forest operations manager 42
forest ranger, wildlife management 163
forest seedling grower 526
forest survey technician 161
forest technician 161
forest worker 535
forester 128
forestry professionals 127
forestry superintendent 128
forestry technician 161
forestry technologist 161
forestry technologists and technicians 160
forestry worker 538
forge helper 585
forging press operator 582
forklift driver 508
formation fracturing operator 533
formulation technician 154
fortune teller 402
foster parent 395
foundation drill operator 489
foundation technologist 168
foundry engineer 137
foundry manager 42
fourdrinier machine operator 552
fourth engineer officer 188
fracturing supervisor 516
framing carpenter 455
freight car cleaner 417
freight forwarding manager 42

freight handler (except airline) ... 508
freight railway engineer ... 484
freight sales agent ... 370
freight shipper/receiver ... 116
freight train conductor ... 484
French as second language teacher, high school ... 268
French immersion teacher, elementary school ... 268
front desk agents ... 379
front desk manager ... 42
front office agent ... 379
front-end brakeman/woman ... 484
fruit picker ... 546
fruit tree pruner ... 540
fumigator, pests ... 505
fund-raising consultant ... 306
funeral attendant ... 423
funeral director ... 368
funeral directors and embalmers ... 367
fur cleaner ... 423
fur designer ... 332
fur garments patternmaker ... 332
fur storage attendant ... 423
furnace charger ... 555
furnace cleaner ... 417
furnace helper ... 585
furnace operator - foundry ... 555
furniture appraiser ... 90
furniture assembler ... 578
furniture cabinetmaker ... 455
furniture finisher ... 578
furniture inspector ... 578
furniture mover ... 508
furniture mover helper ... 512
furniture packer ... 586
furniture polisher ... 578
furniture salesperson ... 372
furniture stripper ... 578
furniture upholsterer ... 478
furrier ... 478

G
gaffer ... 323
galvanizer ... 579
game concession operator ... 420
game officer ... 163
game warden ... 163
gantry crane operator ... 487
garbage collection inspector ... 389
garbage collector ... 512
garde manger, chef ... 354
garden centre owner ... 525
garden machinery assembler ... 576
garment inspector ... 567
gas broker ... 92
gas fitter ... 449
gas leak locator ... 505
gas maintenance worker ... 505
gas plant operator ... 552
gas servicer ... 449
gas station attendant (except self-serve) ... 407
gas-shielded arc welder ... 582
gastroenterologist ... 194
gate attendant ... 415
gathering machine operator - printing ... 572
gemmologist ... 478
general contractor ... 42
general counsel ... 260
general farm workers ... 540
general manager ... 39
general pathologist ... 194
general practice dentist ... 199
general practitioner (GP) ... 197
general practitioners and family physicians ... 196
general secretary ... 95
general surgeon ... 194
generating station operator ... 482
geneticist ... 125
geochemical technician ... 154
geographer ... 283
geological technician ... 154
geophysical engineer ... 137
geophysical technologist ... 154
geriatrician ... 194
ghost writer ... 305
glaciologist ... 122
glass blower ... 332
glass finishing machine operator ... 555
glass inspector ... 556
glass pressing machine operator ... 555
glazier helper ... 511
goal judge ... 337
golf club assembler ... 579
golf course superintendent ... 165
golf professional ... 337
golfer ... 337
grader - wood processing ... 561
grader operator ... 498
grader tallyman/woman, wood processing ... 561
granulator machine operator ... 558
graphic artist ... 331
graphic design sales representative ... 370
grapple yarder operator ... 522
greenhouse manager ... 525
greenhouse supervisor ... 526
greenhouse worker ... 542
greenskeeper ... 542
grill cook ... 355
grip ... 324
grocery packer ... 407
grocery store cashier ... 405
ground transportation driver ... 495

ground worker, telecommunications 512
grounds maintenance worker 546
groundwater geologist 122
groundwater technologist 155
group home worker 290
guest service agent 379
guest services attendant, hotel 420
guidance counsellor 268
guitar player 312
gymnastics coach 337
gynecologist 194

H

hair colour technician 365
hairdresser 365
hairdressing teacher 265
hairstylist 365
hairstylists and barbers 365
handyman/woman 417
hansard court reporter 95
hardware 137
hardware store clerk 372
harness race driver 337
harness racing starter 337
harvester machine operator 540
haulageman/woman 532
head baker 359
head bartender 385
head caretaker 343
head cashier 343
head chef 354
head coach 337
head custodian 343
head janitor 343
head, facilities management 42
health care aide 256
health care planner 283
health physicist 121
health promotion program officer 283
health records technician 100
hearing aid dealer and consultant 251
heat and frost insulator 463
heating and cooling mechanic 466
heating designer 168
heating engineer 132
heating technician 474
heavy duty equipment mechanic 466
heavy equipment fitter 467
heavy equipment mechanic 466
heavy equipment mechanic apprentice 466
heavy equipment operators 498
heavy equipment sales representative 346
heavy equipment servicer 505
heavy mobile logging/mining equipment mechanic 466
heavy-duty cleaner 417
helicopter pilot 187
helper - chemical processing 585
hematological pathologist 194
herbalist 241
heritage interpreter 382
hide grader 567
high school teacher, special education 268
high technology 33 - 36
highway engineer 132
highway police officer 361
highway technician 168
histologist 125
historian 283
history teacher, secondary school 268
hockey coach 337
hockey player 337
hockey scout 337
hoe chucker operator 522
hoisting equipment operator 487
home demonstrator - retail 407
home economist 283
home inspector 184
home renovator 42
home support worker 395
home-health aide 395
homeopath 241
horticultural technician 165
horticulture specialist 165
horticulture technician 542
horticulture worker supervisor 526
horticulturist 165
hospital admitting clerk 100
hospital cleaner 417
hospital cook 355
hospital executive housekeeper 343
hospital pharmacist 213
hospital porter 256
hospital unit clerk 99
hot air balloonist 382
hot press operator 582
hotel accommodations sales executive 370
hotel cleaner 417
hotel clerk supervisor 343
hotel executive housekeeper 343
hotel valet 423
hothouse worker 542
house cleaner 417
house detective 389
housekeeper 395
housekeeping aide 395
housekeeping director 343
housekeeping manager 343
housing policy analyst 283
human resources clerk 108
human resources information specialist 57
human resources manager 41

human resources officer 67
human resources research officer 57
human rights officer 283
humorist 305
hunting guide 382
hvac engineer 132
HVAC technologist 169
hydraulic engineer 132
hydraulic mechanic 467
hydrogeological engineer 137
hydrologist 122
hydrometallurgical engineer 137
hydrometallurgist 137
hydrometeorologist 122
hydroponics technician 165

I

ice cream counter attendant 412
ice maker 420
ice service specialist 155
icer, fishing vessel 544
illustrator 331
image consultant 402
immigration agent 79
immigration examining officer 79
immigration officer 79
immigration, employment insurance and
  revenue officers 78
immunologist 125
import clerk 108
income maintenance officer 290
independent paralegal 288
independent trucker 431
industrial ambulance driver 247
industrial and commercial buildings architect 141
industrial audiometric technician 251
industrial butcher 569
industrial cleaner 417
industrial designers 180
industrial development officer 283
industrial economist 283
industrial electricians 438
industrial engineering technician 169
industrial engineering technologist 169
industrial firefighter 363
industrial hygiene engineer 132
industrial hygiene technologist 154
industrial hygienist 282
industrial instrument mechanic 176
industrial instrument technicians and mechanics 176
industrial instrumentation technician 176
industrial mechanic 466
industrial motor winder repairer 474
industrial pharmacist 213
industrial photographer 323
industrial product painter 579
industrial relations officer 67
industrial supplies sales representative 346
industrial trade economist 283
industrial waste treatment engineer 132
infantry soldier 389
information clerk 111
information officer 305
information specialist 300
information technology .... 33 - 36
ink sketcher 313
inorganic chemist 121
inspector 423
inspector, car and truck assembly 575
inspector, electronics 576
inspector, financial institutions 55
inspector, flight test 467
inspector, rubber manufacturing 558
installation technician, cable television 447
institution case management officer 278
instructor, orientation and mobility 295
instructors and teachers of disabled persons 295
instrument inspector, aircraft 178
instrument overhaul and repair mechanic 178
instrumentalist 312
instrumentation and control engineer 132
insulation applicator 463
insulator 463
insurance actuary 146
insurance adjuster 86
insurance adjusters and claims examiners 85
insurance agent 348
insurance agents and brokers 348
insurance broker 348
insurance clerk 105
insurance manager 41
insurance sales representative 348
insurance underwriters 87, 88
interactive media developer .... 33 - 36, 151
intergovernmental affairs officer 283
interior design technician 332
interior systems mechanic 459
interlibrary loan clerk 110
internal auditor 46
international aid and development
  project officer 283
interpreter for the deaf 306
interpretive dancer 312
interview clerk 111
inventory checker 508
inventory clerk 116
inventory control clerk 116
investigative reporter 305
investment advisor 49
investment advisor 52
investment analyst 49

investment economist 283
investment representative 49
investment underwriter 55
ironworker 453
irrigator 540

J
jeweller 478
jewellery annealer 582
jewellery designer 332
jewellery salesperson 372
jig maker 433
jockey 337
journeyman/woman carpenter 455
journeyman/woman cook 355
judicial clerk 108
juicer 523
jumbo drill operator 519
justice of the peace 77

K
kayaking guide 382
kennel attendant 402
key grip 323
keypunch operator 102
kiln cleaner 585
kindergarten teacher 268
kinesiologist 283
kitchen cupboard and vanity installer 505
kitchen designer 332
kitchen helper 412
knitting machine operator 564

L
laboratory animal attendant 402
laboratory equipment cleaner 417
laboratory technician, biochemistry 154
laboratory technician, chemical 154
laboratory technologist, chemical 154
labour economist 283
labour policy analyst 283
labour relations officer 57
labourer - gas utility 585
labourer, concrete paving 511
labourer, excavation 511
labourers in processing, manufacturing and utilities 585
laminating machine operator 572
lamp keeper 532
land use planner 142
landing person 535
landscape and horticulture technicians and specialists 164
landscape architectural technician 165
landscape gardener 165
landscape labourer 546
landscape service contractor 526
landscape specialist 165
landscape technician 165
landscaper 165
landscaping manager 526
landscaping/grounds maintenance worker 542
language instructor, language school 265
lathe operator - woodworking 582
lather 459
laundromat attendant 423
laundry finisher 423
laundry machine operator 423
laundry worker 423
law clerk 288
law partner 260
lawn care specialist 165
lawn maintenance contractor 526
lawnmower assembler 576
lawyers 260
layout designer 331
lead refiner 555
leasehand 546
leasing coordinator, property 69
leather cleaner 423
leather cutter 567
leather goods inspector 567
leather products patternmaker 332
leather worker 332
lecturer, university 263
legal advisor 260
legal assistant 288
legal researcher 288
legal secretary 95
legal surveyor 142
legal terminologist 306
legislative assistant 65
letter carrier 113
lettering artist 323
level boss 516
liaison officer 62
librarian, elementary school 268
librarian, high school 268
librarians, archivists, conservators and curators 300
library assistant 319
library clerk 110
library consultant 300
library technician 319
library, correspondence and related information clerks 110
licence clerk 108
licensed customs broker 92
licensed graduate nurse (LGN) 222
licensed practical nurse 244

lieutenant, firefighter 363
life skills instructor 290
lifeguard 337
lighting assistant 323
lighting designer 332
lighting technician 323
lighting technologist 172
limousine driver 495
line and station installer, telephone 445
line cook 355
lineman/woman, telecommunications 443
linesman/woman, sports 337
linguist 283
lining stitcher 566
liquid fuels engineer 132
liquor licence inspector 389
liquor sales representative - wholesale 370
liquor store supervisor 343
literary translator 306
litigation legal assistant 288
litigation secretary 95
live-in caregiver 400
livestock contractor 525
load planner, airline 378
loader operator 498, 523
loading bridge operator 502
loan officers 83
loans officer 83
local tour guide 382
locomotive engineer - railway 484
log technician 154
logging and perforating operator 519
logging labourer 546
logging machinery operators 522
logging truck driver 495
long haul truck driver 495
long range planner 142
long term care aide 256
longshore workers and material handlers 508
loom operator 564
loss prevention technologist 169
luggage attendant 420
lumber grader 561
lumber kiln operator 561
lumber piler - wood processing 586
lunch room supervisor 397
lyricist 312

M

machine designer 169
machine fitter 467
machine operator, laundry and dry-cleaning 423
machine operator, railway 501
machine operators and related workers in chemical, plastic and rubber processing 558
machine operators and related workers in fabric and leather products manufacturing 566
machine operators and related workers in food and beverage processing 569
machine operators and related workers in metal and mineral products processing 555
machine operators and related workers in pulp and paper production and wood processing 560
machine operators and related workers in textile processing 564
machine shop inspector 433
machine tender 561
machine tool set-up operator 433
machined parts inspector 433
machinery and transportation equipment mechanics (except motor vehicle) 465
machining inspector 433
machinist 433
machinists and related occupations 433
magazine sales representative - wholesale 370
magician 328
mail and message distribution occupations 112
mail carrier 113
mail room clerk 113
mail sorter 113
maintenance carpenter 455
maintenance millwright 466
maintenance plumber 449
maintenance technician, cable television 447
maître d' 385
maître d'hôtel 385
make-up artist 323
mammography technician 227
management analyst 59
management information systems (mis) analyst 148
manager, business school 42
manager, court services 77
manager, gas supply operations 42
manager, market research service 41
managing editor 42
manicurist 402
manipulator operator 582
manufacturing technician 169
manufacturing technologist 169
manuscript editor 305
mapping and related technologists and technicians 180
marble setter 459
marina attendant 407
marina manager 42
marine biologist 125
marine boilermaker 453
marine electrician 438
marine engine mechanic 502
marine engine oiler 502
marine engineer 137
marine engineer officer 188

marine engineer officer - military 188
marine engineering technologist 169
marine geoscience technologist 154
marine pipefitter 449
marine plant gatherer 546
marine traffic regulator 188
marine underwriter 88
maritime surface and sub-surface officer - military 188
market researcher 283
marketing analyst 283
marketing consultant 283
marketing manager 42
marriage counsellor 276
mason 459
masonry and plastering trades 458
mass spectrometer technician 154
massage therapist 251
master control room (MCR) technician 323
master dyer, textiles 154
master mariner 188
material estimator 116
material management officer 72
materialman/woman 532
materials scientist 122
mathematician 146
mathematicians, statisticians and actuaries 145
mayor 38
meat cutter, retail and wholesale 357
meat grader 569
meat packager 586
meat trimmer 569
mechanic, aircraft maintenance 467
mechanic's helper, automotive 512
mechanical artist 323
mechanical assembler 576
mechanical engineering technician 169
mechanical engineering technologist 169
mechanical fitter 467
mechanical harvester and forwarder operator 523
mechanical maintenance engineer 132
mechanical technologist 169
mechanical, electrical and electronics assemblers 575
media coordinator 305
media relations officer 305
mediator 57
medical biochemist 194
medical doctor (MD) 197
medical illustrator 331
medical instrumentation sales engineer 346
medical laboratory assistant 227
medical laboratory technician 227
medical laboratory technologist 227
medical microbiologist 194
medical office clerk 99
medical physicist 121
medical receptionist 100
medical records clerk 100
medical secretary 95
medical social worker 273
medical sonographer 227
medical supply clerk 116
medical technologists and technicians
  (except dental health) 226
medical terminologist 306
medical transcriptionist 95
meeting planner 74
member of legislative assembly 38
member of parliament 38
mental health nurse 222
mental health worker 290
merchandiser 352
messenger 113
metal arts worker 332
metal cable maker operator 582
metal caster 555
metal fabricator 453
metal forming, shaping and erecting occupations 452
metal mould maker 433
metal pattern maker 433
metal products finisher 579
metal spray operator 579
metallurgical technologist 154
metallurgist 122
metalworking machine helper 585
meteorological inspector 155
metering technologist 172
methods engineer 137
metrologist 121
microbiologist 125
microbiology quality control technologist 158
microbiology technologist 158
microwave maintenance technician 172
microwave systems engineer 132
midwife 241
midwives and practitioners of natural healing 240
military pilot 187
military police officer 361
mill electrician 438
milliner 478
millwork assembler 578
millwright 466
millwright helper 512
mine construction worker 532
mine design engineer 137
mine development engineer 137
mine electrician 438
mine foreman/woman 516
mine geologist 122
mine layout engineer 137
mine manager 42
mine production engineer 137
mine safety engineer 137

mine service workers and operators in oil and gas drilling 532
mine supervisor 516
mine ventilation engineer 137
miner 519
mineral engineer 137
mineral sampler 556
mineralogist 122
mineralogy technician 154
mining engineering technologist 155
mining machine operator 519
mining technologist 154
mirror maker 555
mixer - chemical processing 558
mixer operator 569
mobile broadcast equipment operator 323
mobile crane operator 487
mobile equipment dispatcher 116
mobile radio installer 445
model 328
molecular biologist 125
money market analyst 49
mortgage broker 55
mortgage brokerage manager 41
mortgage clerk 105
mortgage officer 83
motel manager 42
motion picture camera operator 323
motion picture projectionist 324
motor transport labourer 512
motor vehicle and transit drivers 494
motor vehicle assembler 575
motor vehicle body technician 471
motor vehicle inspector 184
motor vehicle mechanics 470
motorcycle mechanic 474
motorman/woman 533
mould cleaner, rubber manufacturing 586
mould designer 169
mould making machinist 433
moulder, clay products 556
mountain climbing guide 382
moving van driver 495
moving van helper 512
mucking machine operator 519
muffler installer 505
multi-service operator 516
municipal engineer 132
municipal engineering assistant 168
municipal labourer 512
municipal planner 142
museum cataloguer 319
museum educator 306
museum exhibit designer 332
museum extension officer 320
museum guide 319
museum interpreter 319
museum registrar 319
museum technician 319
music adapter 312
music teacher 312
music therapist 218
musical director 312
mutual fund representative 49
mutual fund salesperson 52

N

nanny 400
national team coach 337
native band chief 38
native issues lobbyist 283
native outreach worker 290
natural resource policy analyst 282
nature guide 382
naturopath 210
naval 137
naval architect 137
naval weapons technician 389
navigation officer, coast guard vessel 187
nephrologist 194
netmender, fishing vessel 544
network engineer, electrical 132
network operations manager 41
network operator 33 - 36, 102
network reporter 305
neurologist 194
neuropathologist 194
neurosurgeon 194
news analyst 305
news commentator 305
news editor 305
news reader 328
newspaper critic 305
newspaper delivery supervisor 343
night clerk 379
night watchman/woman 415
911 dispatcher 116
nipper 532
nitrogen operator 533
notary public 288
novelist 305
nuclear engineer 132
nuclear magnetic resonance (nmr) spectroscopist 121
nuclear medicine technologist 227
nuclear physicist 121
numerical control tool programmer 169
nurse aide 256
nurse aides and orderlies 256
nurse clinician 222
nurse educator 222
nursery and greenhouse workers 542

nursery manager 526
nursery operator 526
nursery worker 542
nursing assistants 243
nursing attendant 256
nursing consultant 222
nursing researcher 222
nutrition and dietetics researcher 215

O

obstetrician 194
occupational counsellor 292
occupational health nurse 222
occupational hygienist 282
occupational safety and health inspector 184
occupational therapist 218
occupational therapy aide 410
occupations in food and beverage service 384
oceanographer 122
oceanographic chemist 121
office administrator 62
office assistant 100
office cashier 405
office cleaner 417
office clerk 100
office equipment operators 102
office equipment service technician 174
office manager 62
office space planner 332
officer, office of the speaker 283
officer, royal commission 283
officer, standing or select committee 283
officer-in-charge, weather station 155
offset press operator 572
offshore diver 491
oil and solid fuel heating mechanic 474
oil burner apprentice 474
oil burner mechanic 474
oil distributor 370
open-pit blaster 489
open-pit driller 489
opera singer 312
operating room technician 244
operating systems programmer 151
operations technician, weather station 155
ophthalmic assistant 251
ophthalmic dispenser 238
ophthalmologist 194
optical engineer 137
opticians 238
optics physicist 121
options specialist 49
optometrist 205
optometrist assistant 410
optometrists 204
oral medicine specialist 199
oral pathologist 199
oral radiologist 199
oral surgeon 199
orchestrator 312
order filler 407
orderly 256
ordinary seaman/woman 501
orepass tender 532
organic chemist 121
organic mass spectrometrist 122
organizational analyst 59
organometallic chemist 121
ornamental ironworker 453
orthodontic band maker 232
orthodontist 199
orthopaedic shoemaker 478
orthopedic surgeon 194
orthoptist 210
orthotic technician 227
orthotist 227
osteopath 210
other assembly and related occupations 578
other attendants in travel, accommodation and recreation 419
other construction srades 462
other elemental service occupations 422
other engineers 135
other financial officers 54
other installers, repairers and servicers 504
other mechanics 473
other occupations in personal service 401
other occupations in protective service 388
other professional occupations in health diagnosing and treating 209
other sales and related occupations 406
other technical inspectors and regulatory officers 183
other technical occupations in therapy and assessment 250
other transport equipment operators and related workers 501
otolaryngologist 194
outboard motor mechanic 474
outfitter 382
outplacement counsellor 292
oyster picker 546

P

packager, machine 586
paddock judge 337
page designer 331
paint machine operator 579
paint technician 154
painter and decorator 463
painter, motor vehicle repair 471

paleontologist 122
paper mill manager 42
paper products machine operator 561
paperhanger 463
paralegal 288
paralegal and related occupations 287
paramedic 247
parasitologist 125
parents' helper 400
park caretaker 526
park planner 142
park ranger 163
parking control officer 389
parking lot attendant 423
parking lot supervisor 343
parking meter collector 512
parole officer 278
particle board line operator 561
parts clerk 116
passenger agent, airline 378
passenger attendant 420
passenger service director 376
passenger train conductor 484
passport clerk 108
paste-up artist 323
pastry chef 354
patent agent 282
pathologist's assistant 227
patient care aide 256
paving equipment operator 498
pay and benefits clerk 105
pay clerk 105
payroll officer 105
payroll service manager 41
pediatric dentist 199
pediatrician 194
pedicurist 402
percussionist 312
periodical writer 305
periodicals sales representative 370
periodontist 199
peripheral operator 102
personal aide 395
personal banking officer 83
personal banking representative 83
personal care attendant 256
personnel and recruitment officers 66
personnel clerk 108
personnel selection officer 67
pest control technician 505
pest controller 505
pet groomer 402
petrochemical engineer 132
petroleum chemist 122
petroleum engineer, completion 137
petroleum engineering technologist 154
petroleum geologist 122
petroleum technician 154
petrologist 122
petrology technician 154
pharmacists 212, 213
pharmacological chemist 121
pharmacologist 125
photo editor 305
photocopy machine technician 174
photofinisher 572
photographers, graphic arts technicians and technical occupations in motion pictures, broadcasting and the perf 321
photojournalist 323
physiatrist 194
physical chemist 121
physical metallurgical engineer 137
physical metallurgist 122
physical science professionals 120
physical therapist 218
physical therapy aide 410
physiologist 125
physiotherapist 218
physiotherapy helper 410
piano assembly inspector 579
piano repairer 505
picture framer 319
pilot instructor 187
pilot plant technician 154
pipe worker 532
pipefitter 449
pipeline maintenance worker 505
pipeline patrolman/woman 505
piping engineer 132
placement officer 67
planer operator 561
planer operator - woodworking 582
planner 142
planning analyst 142
planning engineer, electrical systems 132
planning officer, child health care programs 283
planning technician 169
plant breeding technician 158
plant cleaner 417
plant electrician 438
plant engineer 137
plant equipment mechanic 466
plant maintenance electrician 438
plant maintenance superintendent 42
plasma physicist 121
plasterer 459
plastic 195
plastic parts assembler 578
plastic products inspector and tester 578
plastics fabricator 578
plastics manufacturing technician 169

plate glass installer 462
platemaker 572
plater 453
platework fitter 453
playground worker 337
playwright 305
pleats finisher 423
plumber 449
plumber's assistant 511
plumbers, pipefitters and gas fitters 449
plumbing inspector 184
plumbing mechanic 449
plywood drier feeder 586
plywood panel assembler 561
podiatrist 210
poet 305
police cadet 361
police diver 361
police lieutenant 42
police officer 361
police officers (except commissioned) 361
police sergeant 361
policy analyst, immigration 283
policy and program officers, researchers and consultants 280
policy consultant, employment equity 283
policy development officer, nursing homes 283
political scientist 283
polymer chemist 121
polymer engineer 132
pool coordinator - recreation 283
port meteorological inspector 155
portfolio manager 49
portrait painter 313
portrait photographer 323
post office manager 41
postal clerk 113
postal counter clerk 113
postal inspection officer 389
post-production technician 323
potter 332
poultry preparer 569
pound attendant 402
power dispatcher 482
power electrician 439
power engineer 482
power engineer apprentice 482
power line patroller 441
power lineman/woman 441
power station electrician 440
power station operator 482
power system electricians 439, 440
power systems operator 482
preboarding security guard 415
precast concrete finisher 459
precious stone setter 478
prefabricated housing assembler 578
preparator 319
pre-press technician 572
pre-school supervisor 393
pre-school teacher 393
president 39
press secretary 306
presser 423
pressure vessel welder 582
price clerk - retail 407
primary production labourers 546
primary school teacher 268
principal 42
principal estimator - construction 168
printing machine operators and related occupations 571
printing operator - textiles 564
printing plant manager 42
printing press operator 572
prison guard 389
private branch exchange (PBX) installer 445
private duty nurse 222
private investigator 389
probation and parole officers and related occupations 278
probation officer 278
process control engineer, chemical 132
process control engineer, electrical 132
process engineer 132
procurement clerk 116
procurement officer 72
produce buyer 352
produce clerk 407
produce department supervisor 343
product tester, food and beverage processing 569
production assistant, broadcasting 324
production coordinator 116
production editor 305
production engineer 137
production engineer, oil and gas 137
production painter 579
production scheduler 116
production supervisor, dry cleaning 343
production support technician, electronics 172
production welder 582
professional athlete 337
professional forester 128
professional image consultant 402
professional land surveyor 142
professional occupations in business services to management 59
professor of computer sciences 263
professor of medicine 263
program assistant, education 398
program coordinator, broadcasting 323
program officer, natural and applied science 283

programmer - computer systems 150
programmer analyst 150
project architect 141
project engineer, chemical 132
project engineer, construction 132
project manager - computer systems 148
project manager, interior design 332
projectionist 324
promotion specialist 59
prompter 324
proofreader 110
property administrators 69
property assessor 90
property manager 69, 350
property officer 69
property standards inspector 389
property surveyor 142
property underwriter 88
property valuator 90
props person 323
prospecting geologist 122
prosthetic technician 227
prosthetist 227
prosthodontist 199
protocol officer 283
protozoologist 125
provincial court clerk 108
provincial land surveyor 142
psychiatric aide 256
psychiatric social worker 273
psychiatrist 194
psychic consultant 402
psychic reader 402
psychologists 271
psychometrician 283
public affairs officer 306
public health dentist 199
public health inspector 184
public health nurse 222
public relations consultant 306
public speaking consultant 402
public transit driver 495
public works engineer 132
public works labourer 512
publicist 306
publicity agent 306
publisher 39
pulp and paper manufacturing technologist 169
pulping group operator 552
pumper operator 533
pumpman/woman 533
punch press operator 582
puppeteer 328
purchaser, furniture and furnishings 72
purchasing agent 72
purchasing agents and officers 71
purchasing assistant 116
purchasing manager 41
purchasing officer 72
purser, airline 376
pursers and flight attendants 376
pyrometallurgical engineer 137
pyrometallurgist 137

Q

quality assurance technologist 169
quality control chemist 121
quality control engineer 137
quality control technician, chemical processing 154
quality control technician, food processing 154
quality controller 567
quantity surveyor - construction 168

R

race track cashier 405
racetrack timer 337
radiation oncologist 194
radiation therapy technologist 227
radio host/hostess 328
radio operator 116
radio producer 312
radio programming manager 42
radio systems engineer 132
radio technician 323
radio writer 305
radiography technologist 227
rafting guide 382
railcar mechanic 467
railway car loader 508
railway carman/woman 467
railway carman/woman apprentice 467
railway hostler 484
railway labourer 512
railway police officer 361
railway superintendent 42
railway transport operations supervisor 431
raise miner 519
raise miner helper 532
ranch hand 540
rancher 525
RCMP officer 361
reader 110
real estate agents and salespersons 349
real estate appraiser 90
real estate clerk 105
real estate law clerk 288
real estate manager 41
real estate secretary 95
receiver 116
receptionist 100

record producer 312
recording artist 312
recording engineer 323
recording studio technician 323
recording, scheduling and
  distributing occupations 115
records system clerk 100
recreation attendant 420
recreation consultant 283
recreation planner 142
recreation program leader 337
recreational therapist 218
recruitment officer 67
reference assistant 319
reference clerk 110
refiner operator - pulp and paper 561
refinery engineer 132
refinery operator 552
reflexologist 241
refrigeration and air-conditioning mechanic 467
refrigeration engineer 132
refrigeration mechanic 467
refrigerator repairer 474
regional inventory officer-forestry 128
regional planner 142
regional sales manager 42
regional transmitter technician 323
regional vice-president 39
registered futures representative 49
registered nurse (RN) 222
registered nurses 221
registered nursing assistant (in provinces and territories other than B.C.) 244
registered professional forester (rpf) 128
registered psychiatric nurse (RPN) 222
registrar 42
registrar of bankruptcy 77
rehabilitation assistant 251
rehabilitation counsellor 276
rehabilitation instructor 295
rehabilitation worker 290
reinforcing ironworker 453
relocation consultant 292
relocation counsellor 292
renovation carpenter 455
rental service supervisor 343
reporter 305
research analyst, health policy 283
research audiologist 218
research chemist 121
research dietitian 215
research psychologist 271
research scientist, aerospace 121
research scientist, ceramics 122
research scientist, communications 121
research scientist, composite materials 122
research scientist, electronics 121
research scientist, physics 121
research scientist, remote sensing 121
researcher, organization and methods 60
researcher, radio or television 305
reservation agent, airline 378
reservations agent 380
reservations supervisor 343
reservoir engineering technician 154
resident care aide 395
resident physician, general practice 197
residential architect 141
residential real estate salesperson 350
resource officer, forest inventory 161
resource technician - forestry 161
respiratory therapist 227
restaurant host/hostess 385
restaurant manager 42
restoration technician 319
retail analyst 283
retail and wholesale buyers 352
retail loss prevention officer 389
retail pharmacist 213
retail sales clerk 372
retail salesperson 372
retail salespersons and sales clerks 372
retail space planner 332
returning officer 283
revenue officer 79
rheumatologist 194
riding instructor 337
rig manager 516
rigger 324
rigging slinger 523
road freight brakeman/woman 484
road maintenance worker 512
road oiling truck driver 498
roadway lighting design engineer 132
rock mechanics technician 154
rolfer 241
rolls operator 582
roofer 462
roofer helper 511
room attendant 417
room clerk 379
rotary drilling machine operator 489
rough carpenter 455
route supervisor, retail sales 343
rubber processing machine operator 558
runner 113

S

safety engineer 137
salad bar attendant 412
sales and service supervisors 342

sales representative, technical sales ... 346
sales representatives, wholesale trade (non-technical) ... 370
sample cutter ... 567
sample maker ... 566
sample sewer ... 566
sandblaster ... 417
sandwich maker ... 412
sanitation engineer ... 132
saucier ... 354
sawyer ... 561
scaler technician - logging ... 161
scalp treatment specialist ... 402
scanner operator ... 572
scarification equipment operator ... 538
scenic painters ... 323
schedule analyst ... 116
schedule writer, transportation ... 116
scheduling clerk ... 116
scheduling technician, manufacturing ... 169
school board trustee ... 38
school bus driver ... 495
school counsellor ... 268
school district superintendent ... 42
scientific consultant ... 282
scientific illustrator ... 331
scientific photographer ... 323
scientific programmer ... 150
scientific writer ... 305
scooptram operator ... 519
screen maker ... 572
screen print operator ... 572
screen printing operator - textiles ... 564
screen writer ... 305
screener - chemical processing ... 558
script editor ... 305
script supervisor ... 323
seamstress ... 478
second cook ... 355
second engineer ... 188
second mate, ship ... 187
second officer ... 187
secondary and elementary school teachers and counsellors ... 267
secondary school teacher's assistant ... 398
secretaries, recorders and transcriptionists ... 94
section worker, railway ... 501
securities agents, investment dealers and traders ... 51
securities analyst ... 49
securities clerk ... 105
securities manager ... 41
securities sales agent ... 52
security consultant ... 389
security guard ... 415
security guards and related occupations ... 414
security officer ... 415
security officer, private ... 389
security services sales consultant ... 370
sedimentologist ... 122
seed technologist ... 158
seismic technician ... 154
seismologist ... 122
self-serve gas bar cashier ... 405
senator ... 38
senior consultant, operations management ... 60
senior MCR operator ... 323
senior operating technician ... 552
senior teller ... 105
septic tank cleaner ... 417
serging machine operator ... 566
service rig helper ... 546
service rig operator ... 519
service technician ... 474
session musician ... 312
set builder ... 324
set decorator ... 323
set designer ... 332
set dresser ... 323 - 324
set electrician ... 323
sewage plant operator ... 558
sewer flushing truck operator ... 498
sewer maintenance worker ... 512
sewing machine operator ... 566
sewing machine servicer ... 505
sex therapist ... 276
shakerhand ... 546
sheet metal fabricator ... 453
sheet metal mechanic ... 453
sheet metal worker ... 453
sheet steel inspector ... 556
sheetrock applicator ... 459
shellfish processor ... 569
sheriff ... 389
sheriff's officer ... 389
shiatsu therapist ... 241
shift boss ... 516
shingler ... 462
ship boiler tender ... 502
ship broker ... 92
ship loader operator ... 508
ship pilot ... 187
ship purser ... 376
ship's captain ... 188
ship's mate ... 187
shipfitter ... 453
shipfitter helper ... 585
shipper ... 116
shipping agent ... 116
shipping and receiving clerk ... 116
shipyard electrician ... 438
shock absorber installer ... 505
shoe designer ... 332

shoe patternmaker ... 332
shoe repairer ... 478
shoe sewer ... 566
shoe shiner ... 423
shoemaker ... 478
shop fabrication boilermaker ... 453
shop inspector, aircraft repair ... 467
shopping mall manager ... 42
shore captain, fishing ... 42
short order cook ... 355
short-story writer ... 305
shortwave receiving station technician ... 323
shovel operator ... 498
side boom tractor operator ... 498
sidewalk cleaner, manual ... 512
sightseeing boat operator ... 502
sightseeing guide ... 382
sightseeing tour driver ... 495
sign language instructor ... 295
sign language interpreter ... 306
sign painter ... 323
signal gang helper ... 512
silk finisher ... 423
silkscreen artist ... 313
silkscreen technician ... 323
silk-screening machine operator ... 572
silversmith ... 332
silviculture and forestry workers ... 537
silviculture technician ... 161
silviculture worker ... 538
silviculturist ... 165
sitting justice of the peace ... 77
skate maker ... 579
skate press operator ... 582
ski instructor ... 337
ski lift attendant ... 420
ski patroller ... 337
ski resort manager ... 42
skidder operator ... 535
skier ... 337
skip tender ... 532
skip tracer ... 105
skylight assembler ... 578
slickline operator ... 519
small animal veterinarian ... 202
small engine mechanic ... 474
small equipment mechanic apprentice ... 474
small equipment repairer ... 474
snowmobile repairer ... 474
snow-removal equipment operator ... 498
social policy researcher ... 283
social services director ... 42
social survey researcher ... 283
social work supervisor ... 273
social workers ... 273
sociologist ... 283
sod farm equipment operator ... 542
sod layer ... 546
software architect ... 151
software development programmer ... 151
software engineer ... 33 - 36, 137, 151
software programmer ... 151
software sales representative ... 346
software technical architect ... 33 - 36
soil chemist ... 121
soil scientist ... 122
soil technologist, civil engineering ... 168
solicitor ... 260
solid state physicist ... 121
solution mixer operator ... 558
sonar operator ... 389
song writer ... 312
sound effects editor ... 323
sound engineer ... 323
sound insulator ... 463
sound mixer ... 323
sound technician ... 323
sous-chef ... 354
special education assistant ... 397
special education teacher, elementary school ... 268
special effects assistant ... 323
special effects technician ... 323
special events organizer ... 74
specialist chef ... 354
specialist physicians ... 194
specialists in human resources ... 56
specification writer, construction ... 168
speech therapist ... 218
speech writer ... 305
speech-language pathologist ... 218
splicer technician, telephone ... 443
sport attendant ... 420
sport policy analyst ... 283
sports announcer ... 328
sports association director ... 42
sports ball moulder ... 582
sports consultant ... 283
sports editor ... 305
sports program supervisor ... 283
sports scout ... 337
spot welder ... 582
spotlight operator ... 323
spotter ... 423
sprayer, leather or suede ... 423
spreader operator helper, plastic manufacturing ... 586
sprinkler system fitter ... 449
sprinkler system installer ... 449
sprinter ... 337
staff assistant, education ... 398
staffing analyst ... 67
staffing clerk ... 108
staffing officer ... 67

stage director 312
stage manager 323
stage technician 323
stagehand 323
stained glass artist 332
station agent, airline 378
stationary engineer 482
stationary engineers and power station and
  system operators 481
stationmaster 431
statistical analyst 146
statistical clerk 111
statistician 146
steam finisher 423
steam plant operator 482
steamfitter 449
steel roller 555
steelspar operator 523
stencil maker 323
stevedore 508
stitcher operator 572
stock broker 52
stock clerk 116
stock preparation operator 552
stone cutter 556
stone or marble mason 459
stonecutter 459
store detective 389
storekeeper 116
stratigrapher 122
street vendor 407
stress engineer, aerospace 137
stringed instrument maker 332
structural design technologist 168
structural engineer 132
structural engineer, aerospace 137
structural glass glazier 463
structural investigator 168
structural steel erector 453
structural steel fitter 453
student counsellor 268
studio camera operator 323
studio image processing system operator 572
stunt coordinator 323
subsea engineer 137
subway traffic controller 431
suede cleaner 423
supermarket clerk 407
supermarket meat cutter 357
supervisor 428
supervisor, club house attendants 343
supervisor, commissionaires 343
supervisor, correctional officers 389
supervisor, education policy 283
supervisor, employment counsellors 293
supervisor, environmental program development 283
supervisor, investment advisors 52
supervisor, library 300
supervisor, light rail transit operators 431
supervisor, real estate agents 350
supervisor, school bus drivers 431
supervisor, security guards 343
supervisor, theatre attendants 343
supervisor, ticket takers 343
supervisor, wholesale trade representatives 370
supervisors, mining, oil and gas 516
supervisors, railway and motor
  transportation occupations 431
supply management officer 72
supply teacher, elementary school 268
supply teacher, high school 268
supply, processing and distribution aide 410
supreme court registrar 77
surface mount machine operator 575
surface weather observer 155
survey interviewer 111
survey technologists and technicians 180
surveying engineer 132
surveyor helper 512
sweeper 417
swimming coach 337
swimming instructor 337
swimming pool installer 505
switch engineer 484
switch network installer and repairer 445
switchboard operator 100
switcher, broadcasting 323
system operator 102
systems 137
systems analyst 148
systems engineer, aerospace 137
systems operations specialist 33 - 36, 148
systems programmer 151
systems tester 33 - 36

T

talk show host/hostess 328
tank driver 389
tanker loader 508
tanning salon attendant 423
tap dancer 313
tattoo artist 402
tax collection officer 79
tax economist 283
tax enforcement officer 79
tax return preparer 105
taxation manager 42
taxi dispatcher 116
taxi driver 495
taxi inspector 389
taxidermist 319

teacher for the hearing impaired ... 295
teacher of braille ... 295
teacher of the blind ... 295
teacher of the mentally handicapped ... 295
teacher of the physically disabled ... 295
teacher, legal assistant program ... 265
teacher, rehabilitation ... 295
teacher's aide ... 398
teacher's assistant ... 398
technical director ... 312
technical editor ... 305
technical occupations in architecture, drafting, surveying and mapping ... 180
technical occupations in civil, mechanical and industrial engineering ... 167
technical occupations in libraries, archives, museums and galleries ... 319
technical occupations in physical sciences ... 153
technical sales specialists, wholesale trade ... 346
technical sales supervisor ... 346
technical secretary ... 95
technical support analyst ... 33 - 36
technical writer ... 305
telecommunications engineer ... 132
telecommunications equipment technician ... 445
telecommunications installation and repair workers ... 445
telecommunications line and cable workers ... 443
telecommunications line installer ... 443
telecommunications manager ... 41
telemarketer ... 407
telemarketing supervisor ... 343
telephone exchange tester ... 445
telephone installer ... 445
telephone line technician ... 443
telephone operator ... 102
telephone service assistant ... 102
telephone service observer ... 102
telephone solicitor ... 407
telephone survey clerk ... 111
television camera operator ... 323
television host/hostess ... 328
television installer ... 447
television news anchorperson ... 305
television producer ... 312
television servicer ... 174
television systems engineer ... 132
television writer ... 305
tennis court attendant ... 420
terrazzo worker ... 459
test driver ... 575
test engineer, aerospace ... 137
test engineer, electronics ... 132
test pilot ... 187
textile chemist ... 121
textile engineer ... 138
textile machine cleaner ... 586
textile mechanic and repairer ... 466
textile products patternmaker ... 332
textile technologist ... 169
theatre cashier ... 405
theatre technician ... 323
theoretical chemist ... 121
therapy and assessment professionals ... 217
thermal design engineer ... 132
thermal station technician ... 169
thermo-mechanical pulp operator ... 552
thinning saw operator ... 538
third engineer ... 188
third mate, ship ... 188
thoracic surgeon ... 195
through hole placement machine operators ... 575
ticket agent, airline ... 378
ticket taker ... 423
tie tamper operator ... 501
tilesetter ... 459
timberman/woman ... 532
time study analyst ... 169
time-study engineer ... 137
title artist ... 331
title searcher ... 288
toll booth attendant ... 423
tool and die designer ... 169
tool and die maker ... 433
tool designer ... 169
tool engineer ... 132
tool pusher ... 516
tooling inspector ... 433
toolsmith ... 453
totem pole carver ... 332
tour and recreational guides ... 381
tour director ... 382
tour guide supervisor ... 343
tourism development officer ... 283
tourism industry consultant ... 283
tourist information clerk ... 111
tow truck driver ... 495
tower controller, air traffic ... 187
tower crane operator ... 487
toxicologist ... 125
toy designer ... 332
toy inspector ... 579
track athlete ... 337
track boss ... 516
track patroller, railway ... 501
tractor crane operator ... 487
tractor mechanic ... 466
trade economist ... 283
trade mark agent ... 288
trade show planner ... 74
trades helper ... 511

F8

trades helpers, construction labourers and related occupations 511
traffic engineer 132
traffic manager 42
traffic reporter 328
trail-end brakeman/woman 484
train crew operating occupations 484
train dispatch operator 188
train dispatcher 188
train operator 188
train service attendant 420
training officer 57, 265
trainman/woman 532
trainmaster 431
transcriptionist 95
transfer company agent 370
transformer inspector 576
transformer repairer 474
transit scheduler 116
translator, official languages 306
transmission assembler 576
transmission installer 575
transmission mechanic 470
transmission planning engineer 132
transport program analyst 283
transportation engineer 132
transportation officers and controllers 186
transportation safety analyst 282
travel agency manager 42
travel agent 374
travel clerk supervisor 343
travel consultant 374
travel counsellors 373
trawler captain 529
treatment plant mechanic 466
tree planter 546
tree service contractor 526
tree service technician 165
treelength forwarder operator 523
trial coordinator 77
tribunal officer 283
trimmerman/woman 561
trophy designer 332
truck driver helper 512
truck driver, tractor-trailer 495
truck mechanic 470
truck scheduler 116
trust officer 55
tugboat captain 188
tune-up specialist, motor vehicle 470
typesetter 102
typographer 102

U

ultrasound technologist 3216 227
umpire 337
underground miners, oil and gas drillers and related workers 519
underwater contractor 491
underwater welder 491
underwriting account representative 88
underwriting service representative 88
unemployment insurance agent 79
university instructor, engineering 263
university professors 263
upholsterer 478
upholsterers, tailors, shoe repairers, jewellers and related occupations 477
upholstery cleaner 417
upholstery repairer 478
urban planner 142
urologist 195
user support analyst - computer systems 33 - 36, 148
usher 423
utility plant maintenance worker 505

V

vacuum cleaner repairer 474
valuator 90
vegetable packer 546
vehicle cleaner 417
vending machine driver-supplier 495
vending machine repairer 505
ventilation system cleaner 417
ventriloquist 328
vertical press operator 582
veterinarians 201, 202
veterinary attendant 402
veterinary inspector 202
veterinary laboratory technologist 227
veterinary pathologist 202
veterinary physiologist 202
vice-president 39
video and sound recorder 323
video camera operator 323
video recording technician 323
video transmission operator 323
vineyard manager 526
vinyl floor installer 463
virologist 125
visiting homemaker 395
visiting homemakers, housekeepers and related occupations 395
vocalist 312
vocational counsellor 293
vocational rehabilitation counsellor 276
vocational school teacher 265
vocational teacher, high school 268
volleyball coach 337

W
waiter/waitress ... 385
ward aide ... 256
ward clerk ... 108
ward secretary ... 95
wardrobe consultant ... 402
warehouse manager ... 42
warehouse stock picker ... 407
warehouse worker ... 508
warranty clerk ... 108
washing machine servicer ... 474
waste treatment engineer ... 132
waste water treatment plant operator ... 558
watch repairer ... 478
watchkeeping officer, coast guard vessel ... 187
watchmaker ... 478
water filtration plant manager ... 42
water filtration plant operator ... 558
water management engineer ... 132
water taxi operator ... 502
water treatment plant operator ... 558
waterfront police officer ... 361
waterworks maintenance worker ... 505
weapons operator ... 389
weather forecaster ... 122
weather reporter ... 328
weather service specialist ... 155
weaver ... 332, 564
web design technician ... 323
web designer ... 33 - 36, 332
web manager ... 33 - 36, 41
web programmer ... 151
web technician ... 33 - 36, 151
wedding consultant ... 402
weight loss consultant ... 402
welders and machining, metalworking, woodworking and related machine operators ... 581
welding technologist ... 154
welfare and compensation officer ... 290
well services crew supervisor ... 516
well testing operator ... 519
wheelsman/woman ... 501
wig stylist ... 365
wildlife viewing guide ... 382
window cleaner ... 417
window display designer ... 332
window washing supervisor ... 343
wine steward ... 385
wing tank mechanic ... 575
wire screen maker ... 582
wireline operator ... 519
wiring and assembly operator ... 576
women's centre coordinator ... 290
wood burner installer ... 474
wood finisher ... 578
wood furniture assembler ... 578
wood lather ... 459
wood products assembler ... 578
wood products assembling inspector ... 578
wood treater ... 561
word processing clerk ... 100
word processing operator ... 100
work measurement engineer ... 137
wrangler ... 540
writing, translating and public relations professionals ... 304

X
s-ray technician ... 227

Y
yard boss ... 516
yard brake workers ... 484
yard coupler, railway ... 501
yard engineer - railway ... 484
yardmaster ... 431
youth counsellor ... 276
youth worker ... 290
youth worker, corrections ... 278

Z
zoning inspector ... 389
zoo attendant ... 402
zoo veterinarian ... 202
zoologist ... 125

INDEX OF OCCUPATIONS BY NATIONAL OCCUPATIONAL CLASSIFICATION (NOC) CODE

MANAGEMENT OCCUPATIONS

00 Senior Management Occupations 38
01-09 Middle and Other Management 40

BUSINESS, FINANCE & ADMINISTRATION OCCUPATIONS

1111 Financial Auditors and Accountants 46
1112 Financial and Investment Analysts 49
1113 Securities Agents, Investment Dealers and Traders 51
1114 Other Financial Officers 54
1121 Specialists in Human Resources 56
1122 Professional Occupations in Business Services to Management 59
1221 Administrative Officers 62
1222 Executive Assistants 64
1223 Personnel and Recruitment Officers 66
1224 Property Administrators 69
1225 Purchasing Agents and Officers 71
1226 Conference and Event Planners 74
1227 Court Officers and Justices of the Peace 76
1228 Immigration, Employment Insurance and Revenue Officers 78
1231 Bookkeepers 81
1232 Loan Officers 83
1233 Insurance Adjusters and Claims Examiners 85
1234 Insurance Underwriters 87
1235 Assessors, Valuators and Appraisers 90
1236 Customs, Ship and Other Brokers 92
124 Secretaries, Recorders and Transcriptionists 94
141 Clerical Occupations, General Office Skills 99
142 Office Equipment Operators 102
143 Finance and Insurance Clerks 104
144 Administrative Support Clerks 108
145 Library, Correspondence and Related Information Clerks 110
146 Mail and Message Distribution Occupations 112
147 Recording, Scheduling and Distributing Occupations 115

NATURAL AND APPLIED SCIENCES AND RELATED OCCUPATIONS

211 Physical Science Professionals 120
2121 Biologists and Related Scientists 125
2122 Forestry Professionals 127
213 Civil, Mechanical, Electrical and Chemical Engineers 130
214 Other Engineers 135
215 Architects, Urban Planners and Land Surveyors 140
2161 Mathematicians, Statisticians and Actuaries 145
2162 Computer Systems Analysts 147
2163 Computer Programmers 150
221 Technical Occupations in Physical Sciences 153
2221 Biological Technologists and Technicians 157
2223 Forestry Technologists and Technicians 160
2224 Conservation and Fishery Officers 163
2225 Landscape and Horticultural Technicians and Specialists 164
223 Technical Occupations in Civil, Mechanical and Industrial Engineering 167
2241 Electrical and Electronics Engineering Technologists and Technicians 171
2242 Electronic Service Technicians (Household and Business Equipment) 173
2243 Industrial Instrument Technicians and Mechanics 176
2244 Aircraft Instrument, Electrical and Avionics Mechanics, Technicians and Inspectors 178
225 Technical Occupations in Architecture, Drafting, Surveying and Mapping 180
226 Other Technical Inspectors and Regulatory Officers 183
227 Transportation Officers and Controllers 186

HEALTH OCCUPATIONS

3111 Specialist Physicians 194
3112 General Practitioners and Family Physicians 196
3113 Dentists 199
3114 Veterinarians 201
3121 Optometrists 204
3122 Chiropractors 207
3123 Other Professional Occupations in Health Diagnosing and Treating 209
3131 Pharmacists 212
3132 Dieticians and Nutritionists 215
314 Therapy and Assessment Professionals 217
3152 Registered Nurses 221
321 Medical Technologists and Technicians (Except Dental Health) 226
3220 Dental Technicians and Laboratory Bench Workers 231
3221 Denturists 233
3222 Dental Hygienists and Dental Therapists 235
3231 Opticians 238
3232 Midwives and Practitioners of Natural Healing 240
3233 Registered Nursing Assistants 243
3234 Ambulance Attendants and Other Paramedical Occupations 247
3235 Other Technical Occupations in Therapy and Assessment 250
3411 Dental Assistants 254
3413 Nurse Aides and Orderlies 256

OCCUPATIONS IN SOCIAL SCIENCE, EDUCATION AND GOVERNMENT SERVICE

4112 Lawyers 260
4121 University Professors 263
4131 College and Other Vocational Instructors 265
414 Secondary and Elementary School Teachers and Counsellors 267
4151 Psychologists 271
4152 Social Workers 273
4153 Family, Marriage and Other Related Counsellors 276
4155 Probation and Parole Officers and Related Occupations 278
416 Policy and Program Officers, Researchers and Consultants 280
4211 Paralegal and Related Occupations 287
4212 Community and Social Service Workers 290
4213 Employment Counsellors 292
4215 Instructors and Teachers of Disabled Persons 295

OCCUPATIONS IN ART, CULTURE, RECREATON AND SPORT

511 Librarians, Archivists, Conservators and Curators 300
512 Writing, Translating and Public Relations Professionals 304
513 Creative and Performing Artists 311
521 Technical Occupations in Libraries, Archives, Museums and Galleries 319
522 Photographers, Graphic Arts Technicians and Technical Occupations in Motion Pictures, Broadcasting and the Performing Arts 321
523 Announcers and Other Performers 328
524 Creative Designers and Craftspersons 330
525 Athletes, Coaches, Referees and Related Occupations 336

SALES AND SERVICE OCCUPATIONS

621 Sales and Service Supervisors 342
6221 Technical Sales Specialists, Wholesale Trade 346
6231 Insurance Agents and Brokers 348
6232 Real Estate Salespersons and Agents 349
6233 Retail and Wholesale Buyers 352
624 Chefs and Cooks 354
6251 Butchers and Meat Cutters, Retail and Wholesale 357
6252 Bakers 359
6261 Police Officers (Except Commissioned) 361
6262 Firefighters 363
6271 Hairstylists and Barbers 365
6272 Funeral Directors and Embalmers 367
6411 Sales Representatives, Wholesale Trade (Non-Technical) 370
6421 Retail Salespersons and Sales Clerks 372
6431 Travel Counsellors 373
6432 Pursers and Flight Attendants 376
6433 Airline Sales and Service Agents 377
6435 Front Desk Agents 379
644 Tour and Recreational Guides 381
645 Occupations in Food and Beverage Service 384
646 Other Occupations in Protective Service 388
6470 Early Childhood Educators and Assistants 392
6471 Visiting Homemakers, Housekeepers and Related Occupations 395
6472 Elementary and Secondary School Teacher Assistants 397
6474 Babysitters, Nannies and Parents' Helpers 399
648 Other Occupations in Personal Service 401
6611 Cashiers 405
662 Other Sales and Related Occupations 406
6631 Elemental Medical and Hospital Assistants 409
664 Food Counter Attendants and Kitchen Helpers 411
6651 Security Guards and Related Occupations 414
666 Cleaners 416
667 Other Attendants in Travel, Accommodation and Recreation 419
668 Other Elemental Service Occupations 422

TRADES, TRANSPORT AND EQUIPMENT OPERATORS AND RELATED OCCUPATIONS

721 Contractors and Supervisors, Trades and Related Workers 428
722 Supervisors, Railway and Motor Transportation Occupations 431
723 Machinists and Related Occupations 433
7241 Electricians (Construction and Maintenance) 435
7242 Industrial Electricians 438
7243 Power System Electricians 439
7244 Electrical Power Line and Cable Workers 441
7245 Telecommunications Line and Cable Workers 443
7246 Telecommunications Installation and Repair Workers 445
7247 Cable Television Service and Maintenance Technicians 447
725 Plumbers, Pipefitters and Gas Fitters 449
726 Metal Forming, Shaping and Erecting Occupations 452
727 Carpenters and Cabinetmakers 455
728 Masonry and Plastering Trades 458
729 Other Construction Trades 462
731 Machinery and Transportation Equipment Mechanics (except Motor Vehicle) 465
732 Motor Vehicle Mechanics 470
733 Other Mechanics 473
734 Upholsterers, Tailors, Shoe Repairers, Jewellers and Related Occupations 477
735 Stationary Engineers and Power Station and System Operators 481
736 Train Crew Operating Occupations 484
7371 Crane Operators 486
7372 Drillers and Blasters - Surface Mining, Quarrying and Construction 489
7382 Commercial Divers 491
741 Motor Vehicle and Transit Drivers 494

742 Heavy Equipment Operators 498
743 Other Transport Equipment Operators and Related Workers 501
744 Other Installers, Repairers and Servicers 504
745 Longshore Workers and Material Handlers 508
76 Trades Helpers, Construction, Labourers and Related Occupations 511

OCCUPATIONS UNIQUE TO PRIMARY INDUSTRY

822 Supervisors, Mining, Oil and Gas 516
823 Underground Miners, Oil and Gas Drillers and Related Workers 519
8241 Logging Machinery Operators 522
825 Contractors, Operators and Supervisors in Agriculture, Horticulture and Aquaculture 525
826 Fishing Vessel Masters and Skippers and Fishermen/women 529
841 Mine Service Workers and Operators in Oil and Gas Drilling 532
8421 Chainsaw and Skidder Operators 535
8422 Silviculture and Forestry Workers 537
8431 General Farm Workers 540
8432 Nursery and Greenhouse Workers 542
8441 Fishing Vessel Deckhands 544
861 Primary Production Labourers 546

OCCUPATIONS UNIQUE TO PROCESSING, MANUFACTURING AND UTILITIES

923 Central Control and Process Operators in Manufacturing and Processing 552
941 Machine Operators and Related Workers in Metal and Mineral Products Processing 555
942 Machine Operators and Related Workers in Chemical, Plastic and Rubber Processing 558
943 Machine Operators and Related Workers in Pulp and Paper Production and Wood Processing 560
944 Machine Operators and Related Workers in Textile Processing 564
945 Machine Operators and Related Workers in Fabric and Leather Products Manufacturing 566
946 Machine Operators and Related Workers in Food and Beverage Processing 569
947 Printing Machine Operators and Related Occupations 571
948 Mechanical, Electrical and Electronics Assemblers 575
949 Other Assembly and Related Occupations 578
951 Welders and Machining, Metalworking, Woodworking and Related Machine Operators 581
961 Labourers in Processing, Manufacturing and Utilities 585

INDEX OF OCCUPATIONS BY SKILL LEVEL

Management Occupations

00 Senior Management Occupations 38
01-09 Middle and Other Management 4

Skill Level A - Professional Occupations

1111 Financial Auditors and Accountants 46
1112 Financial and Investment Analysts 49
1113 Securities Agents, Investment Dealers and Traders 51
1114 Other Financial Officers 54
1121 Specialists in Human Resources 56
1122 Professional Occupations in Business Services to Management 59
211 Physical Science Professionals 120
2121 Biologists and Related Scientists 125
2122 Forestry Professionals 127
213 Civil, Mechanical, Electrical and Chemical Engineers 130
214 Other Engineers 135
215 Architects, Urban Planners and Land Surveyors 140
2161 Mathematicians, Statisticians and Actuaries 145
2162 Computer Systems Analysts 147
2163 Computer Programmers 150
3111 Specialist Physicians 194
3112 General Practitioners and Family Physicians 196
3113 Dentists 199
3114 Veterinarians 201
3121 Optometrists 204
3122 Chiropractors 207
3123 Other Professional Occupations in Health Diagnosing and Treating 209
3131 Pharmacists 212
3132 Dieticians and Nutritionists 215
314 Therapy and Assessment Professionals 217
3152 Registered Nurses 221
4112 Lawyers 260
4121 University Professors 263
4131 College and Other Vocational Instructors 265
414 Secondary and Elementary School Teachers and Counsellors 267
4151 Psychologists 271
4152 Social Workers 273
4153 Family, Marriage and Other Related Counsellors 276
4155 Probation and Parole Officers and Related Occupations 278
416 Policy and Program Officers, Researchers and Consultants 280
511 Librarians, Archivists, Conservators and Curators 300
512 Writing, Translating and Public Relations Professionals 304
513 Creative and Performing Artists 311

Skill Level B - Technical, Paraprofessional and Skilled Occupations

1221 Administrative Officers 62
1222 Executive Assistants 64
1223 Personnel and Recruitment Officers 66
1224 Property Administrators 69
1225 Purchasing Agents and Officers 71
1226 Conference and Event Planners 74
1227 Court Officers and Justices of the Peace 76
1228 Immigration, Employment Insurance and Revenue Officers 78
1231 Bookkeepers 81
1232 Loan Officers 83
1233 Insurance Adjusters and Claims Examiners 85
1234 Insurance Underwriters 87
1235 Assessors, Valuators and Appraisers 90
1236 Customs, Ship and Other Brokers 92
124 Secretaries, Recorders and Transcriptionists 94
221 Technical Occupations in Physical Sciences 153
2221 Biological Technologists and Technicians 157
2223 Forestry Technologists and Technicians 160
2224 Conservation and Fishery Officers 163
2225 Landscape and Horticultural Technicians and Specialists 164
223 Technical Occupations in Civil, Mechanical and Industrial Engineering 167
2241 Electrical and Electronics Engineering Technologists and Technicians 171
2242 Electronic Service Technicians (Household and Business Equipment) 173

2243 Industrial Instrument Technicians and Mechanics ... 176
2244 Aircraft Instrument, Electrical and Avionics Mechanics, Technicians and Inspectors ... 178
225 Technical Occupations in Architecture, Drafting, Surveying and Mapping ... 180
226 Other Technical Inspectors and Regulatory Officers ... 183
227 Transportation Officers and Controllers ... 186
321 Medical Technologists and Technicians (Except Dental Health) ... 226
3220 Dental Technicians and Laboratory Bench Workers ... 231
3221 Denturists ... 233
3222 Dental Hygienists and Dental Therapists ... 235
3231 Opticians ... 238
3232 Midwives and Practitioners of Natural Healing ... 240
3233 Registered Nursing Assistants ... 243
3234 Ambulance Attendants and Other Paramedical Occupations ... 247
3235 Other Technical Occupations in Therapy and Assessment ... 250
4211 Paralegal and Related Occupations ... 287
4212 Community and Social Service Workers ... 290
4213 Employment Counsellors ... 292
4215 Instructors and Teachers of Disabled Persons ... 295
521 Technical Occupations in Libraries, Archives, Museums and Galleries ... 319
522 Photographers, Graphic Arts Technicians and Technical Occupations in Motion Pictures, Broadcasting and the Performing Arts ... 321
523 Announcers and Other Performers ... 328
524 Creative Designers and Craftspersons ... 330
525 Athletes, Coaches, Referees and Related Occupations ... 336
621 Sales and Service Supervisors ... 342
6221 Technical Sales Specialists, Wholesale Trade ... 346
6231 Insurance Agents and Brokers ... 348
6232 Real Estate Salespersons and Agents ... 349
6233 Retail and Wholesale Buyers ... 352
624 Chefs and Cooks ... 354
6251 Butchers and Meat Cutters, Retail and Wholesale ... 357
6252 Bakers ... 359
6261 Police Officers (Except Commissioned) ... 361
6262 Firefighters ... 363
6271 Hairstylists and Barbers ... 365
6272 Funeral Directors and Embalmers ... 367
721 Contractors and Supervisors, Trades and Related Workers ... 428
722 Supervisors, Railway and Motor Transportation Occupations ... 431
723 Machinists and Related Occupations ... 433
7241 Electricians (Construction and Maintenance) ... 435
7242 Industrial Electricians ... 438
7243 Power System Electricians ... 439
7244 Electrical Power Line and Cable Workers ... 441
7245 Telecommunications Line and Cable Workers ... 443
7246 Telecommunications Installation and Repair Workers ... 445
7247 Cable Television Service and Maintenance Technicians ... 447
725 Plumbers, Pipefitters and Gas Fitters ... 449
726 Metal Forming, Shaping and Erecting Occupations ... 452
727 Carpenters and Cabinetmakers ... 455
728 Masonry and Plastering Trades ... 458
729 Other Construction Trades ... 462
731 Machinery and Transportation Equipment Mechanics (except Motor Vehicle) ... 465
732 Motor Vehicle Mechanics ... 470
733 Other Mechanics ... 473
734 Upholsterers, Tailors, Shoe Repairers, Jewellers and Related Occupations ... 477
735 Stationary Engineers and Power Station and System Operators ... 481
736 Train Crew Operating Occupations ... 484
7371 Crane Operators ... 486
7372 Drillers and Blasters - Surface Mining, Quarrying and Construction ... 489
7382 Commercial Divers ... 491
822 Supervisors, Mining, Oil and Gas ... 516
823 Underground Miners, Oil and Gas Drillers and Related Workers ... 519
8241 Logging Machinery Operators ... 522
825 Contractors, Operators and Supervisors in Agriculture, Horticulture and Aquaculture ... 525
826 Fishing Vessel Masters and Skippers and Fishermen/women ... 529
923 Central Control and Process Operators in Manufacturing and Processing ... 552

Skill Level C - Intermediate Occupations

141 Clerical Occupations, General Office Skills ... 99
142 Office Equipment Operators ... 102
143 Finance and Insurance Clerks ... 104
144 Administrative Support Clerks ... 108
145 Library, Correspondence and Related Information Clerks ... 110
146 Mail and Message Distribution Occupations ... 112
147 Recording, Scheduling and Distributing Occupations ... 115
3411 Dental Assistants ... 254
3413 Nurse Aides and Orderlies ... 256

6411 Sales Representatives, Wholesale Trade (Non-Technical) 370
6421 Retail Salespersons and Sales Clerks 372
6431 Travel Counsellors 373
6432 Pursers and Flight Attendants 376
6433 Airline Sales and Service Agents 377
6435 Front Desk Agents 379
644 Tour and Recreational Guides 381
645 Occupations in Food and Beverage Service 384
646 Other Occupations in Protective Service 388
6470 Early Childhood Educators and Assistants 392
6471 Visiting Homemakers, Housekeepers and Related Occupations 395
6472 Elementary and Secondary School Teacher Assistants 397
6474 Babysitters, Nannies and Parents' Helpers 399
648 Other Occupations in Personal Service 401
741 Motor Vehicle and Transit Drivers 494
742 Heavy Equipment Operators 498
743 Other Transport Equipment Operators and Related Workers 501
744 Other Installers, Repairers and Servicers 504
745 Longshore Workers and Material Handlers 508
841 Mine Service Workers and Operators in Oil and Gas Drilling 532
8421 Chainsaw and Skidder Operators 535
8422 Silviculture and Forestry Workers 537
8431 General Farm Workers 540
8432 Nursery and Greenhouse Workers 542
8441 Fishing Vessel Deckhands 544
941 Machine Operators and Related Workers in Metal and Mineral Products Processing 555
942 Machine Operators and Related Workers in Chemical, Plastic and Rubber Processing 558
943 Machine Operators and Related Workers in Pulp and Paper Production and Wood Processing 560
944 Machine Operators and Related Workers in Textile Processing 564
945 Machine Operators and Related Workers in Fabric and Leather Products Manufacturing 566
946 Machine Operators and Related Workers in Food and Beverage Processing 569
947 Printing Machine Operators and Related Occupations 571
948 Mechanical, Electrical and Electronics Assemblers 575
949 Other Assembly and Related Occupations 578
951 Welders and Machining, Metalworking, Woodworking and Related Machine Operators 581

Skill Level D - Labouring and Elemental Occupations

6611 Cashiers 405
662 Other Sales and Related Occupations 406
6631 Elemental Medical and Hospital Assistants 409
664 Food Counter Attendants and Kitchen Helpers 411
6651 Security Guards and Related Occupations 414
666 Cleaners 416
667 Other Attendants in Travel, Accommodation and Recreation 419
668 Other Elemental Service Occupations 422
76 Trades Helpers, Construction, Labourers and Related Occupations 511
861 Primary Production Labourers 546
961 Labourers in Processing, Manufacturing and Utilities 585

NATIONAL OCCUPATIONAL CLASSIFICATION MATRIX

	1 BUSINESS, FINANCE AND ADMINISTRATION OCCUPATIONS	2 NATURAL AND APPLIED SCIENCES AND RELATED OCCUPATIONS	3 HEALTH OCCUPATIONS	4 OCCUPATIONS IN SOCIAL SCIENCE, EDUCATION, GOVERNMENT SERVICE AND RELIGION
0 MANAGEMENT OCCUPATIONS	011 Administrative Managers 012 Managers in Financial and Business Services 013 Managers in Communication (Except Broadcasting)	021 Managers in Engineering, Architecture, Science and Information Systems	031 Managers in Health, Education, Social and Community Services 041 Managers in Public Administration	
SKILL LEVEL A	**Major Group 11** **Professional Occupations in Business and Finance** 111 Auditors, Accountants and Investment Professionals 112 Human Resources and Business Service Professionals	**Major Group 21** **Professional Occupations in Natural and Applied Sciences** 211 Physical Science Professionals 212 Life Science Professionals 213 Civil, Mechanical, Electrical and Chemical Engineers 214 Other Engineers 215 Architects, Urban Planners and Land Surveyors 216 Mathematicians, Systems Analysts and Computer Programmers	**Major Group 31** **Professional Occupations in Health** 311 Physicians, Dentists and Veterinarians 312 Optometrists, Chiropractors and Other Health Diagnosing and Treating Professionals 313 Pharmacists, Dieticians & Nutritionists 314 Therapy & Assessment Professionals 315 Nurse Supervisors & Registered Nurses	**Major Group 41** **Professional Occupations in Social Science, Education, Government Services and Religion** 411 Judges, Lawyers and Quebec Notaries 412 University Professors and Assistants 413 College & Other Vocational Instructors 414 Secondary and Elementary School Teachers and Counsellors 415 Psychologists, Social Workers, Counsellors, Clergy and Probation Officers 416 Policy and Program Officers, Researchers and Consultants
SKILL LEVEL B	**Major Group 12** **Skilled Administrators and Business Occupations** 121 Clerical Supervisors 122 Administrative and Regulatory Occupations 123 Finance and Insurance Administrative Occupations 124 Secretaries, Recorders and Transcriptionists	**Major Group 22** **Technical Occupations Related to Natural and Applied Sciences** 221 Technical Occupations in Physical Sciences 222 Technical Occupations in Life Sciences 223 Technical Occupations in Civil, Mechanical and Industrial Engineering 224 Technical Occupations in Electronics and Electrical Engineering 225 Technical Occupations in Architecture, Drafting, Surveying and Mapping 226 Other Technical Inspectors and Regulatory Officers 227 Transportation Officers and Controllers	**Major Group 32** **Technical and Skilled Occupations in Health** 321 Medical Technologists & Technicians (except Dental Health) 322 Technical Occupations in Dental Health Care 323 Other Technical Occupations in Health Care (Except Dental)	**Major Group 42** **Paraprofessional Occupations in Law Social Services, Education and Religion** 421 Paralegals, Social Services Workers and Occupations in Education and Religion, n.e.c.
SKILL LEVEL C	**Major Group 14** **Clerical Occupations** 141 Clerical Occupations, General Office Skills 142 Office Equipment Operators 143 Finance and Insurance Clerks 144 Administrative Support Clerks 145 Library, Correspondence and Related Information Clerks 146 Mail and Message Distribution Occupations 147 Recording, Scheduling and Distributing Occupations		**Major Group 34** **Assisting Occupations in Support of Health Services** 341 Assisting Occupations in Support of Health Services	
SKILL LEVEL D				

+1

The National Occupational Classification (NOC) matrix provides an overview of the classification at the minor group level. It also illustrates how the NOC is accessible on the basis of skill level, skill type, or on a combination of these two criteria. The four skill level categories are listed on the left side of the matrix, while nine skill type categories are listed across the top. The tenth skill type category (0) Management Occupations) is organized across the top of the matrix. In most cases, each matrix cell consists of a major group

OCCUPATIONS IN ART, CULTURE, RECREATION AND SPORT	6 SALES AND SERVICE OCCUPATIONS	7 TRADES. TRANSPORT AND EQUIPMENT OPERATORS AND RELATED OCCUPATIONS	8 OCCUPATIONS UNIQUE TO PRIMARY INDUSTRY	9 OCCUPATIONS UNIQUE TO PROCESSING, MANUFACTURING AND UTILITIES
Major Group 00 **Senior Management Occupations** 001 Legislators and Senior Management	→			
051 Managers in Art, Culture, Recreation and Sport	061 Sales, Marketing & Advertising Managers 062 Managers in Retail Trade 063 Managers in Food Service and Accommodation 064 Managers in Protective Service 065 Managers in Other Services	071 Managers in Construction and Transportation 072 Facility Operation & Maintenance Managers	081 Managers in Primary Production (Except Agriculture)	091 Managers in Manufacturing and Utilities
Major Group 51 **Professional Occupations in Art and Culture** 511 Librarians, Archivists, Conservators & Curators 512 Writing, Translating and Public Relations Professions 513 Creative and Performing Artists				
Major Group 52 **Technical and Skilled Occupations in Art, Culture, Recreation and Sport** 521 Technical Occupations in Libraries, Archives, Museums and Galleries 522 Photographers, Graphic Arts Technicians and Technical Occupations in Motion Pictures, Broadcasting and the Performing Arts 523 Announcers and Other Performers 524 Creative Designers and Craftpersons 525 Athletes, Coaches, Referees and Related Occupations	**Major Group 62** **Skilled Sales and Service Occupations** 621 Sales and Service Supervisors 622 Technical Sales Specialists, Wholesale Trade 623 Insurance and Real Estate Occupations and Buyers 624 Chefs and Cooks 625 Butchers and Bakers 626 Police Officers and Firefighters 627 Technical Occupations in Personal Service	**Major Group 72/73** **Trades and Skilled Transport and Equipment Operators** 721 Contractors and Supervisors, Trades and Related Workers 722 Supervisors, Railway and Motor Transportation Occupations 723 Machinists and Related Occs 724 Electrical Trades and Telecommunication Occupations 725 Plumbers, Pipefitters & Gas Fitters 726 Metal Forming, Shaping and Erecting Occupations 727 Carpenters and Cabinetmakers 728 Masonry and Plastering Trades 729 Other Construction Trades 731 Machinery and Transportation Equipment Mechanics (except Motor Vehicle) 732 Motor Vehicle Mechanics 733 Other Mechanics 734 Upholsterers, Tailors, Shoe Repairers, Jewellers and Rel Occs 735 Stationary Engineers and Power Station and System Operators 736 Train Crew Operating Occs 737 Crane Operators, Drillers and Blasters 738 Printing Press Operators, Commercial Divers and Other Trades and Related Occs, n.e.c.	**Major Group 82** **Skilled Occupations in Primary Industry** 821 Supervisors, Logging and Forestry 822 Supervisors, Mining, Oil and Gas 823 Underground Miners, Oil and Gas Drillers and Related Workers 824 Logging Machine Operators 825 Contractors, Operators and Supervisors in Agriculture, Horticulture and Aquaculture 826 Fishing Vessel Masters and Skippers and Fishermen/women	**Major Group 92** **Processing, Manufacturing and Utilities Supervisors and Skilled Operators** 921 Supervisors, Processing Occupations 922 Supervisors, Assembling and Fabricating 923 Central Control and Process Operators in Manufacturing and Processing
	Major Group 64 **Intermediate Sales and Service Occupations** 641 Sales Representatives, Wholesale Trade 642 Retail Salespersons and Sales Clerks 643 Occupations in Travel and Accommodation 644 Tour and Recreational Guides and Amusement Occupations 645 Occupations in Food and Beverage Service 646 Other Occupations in Protective Service 647 Childcare and Home Support Workers 648 Other Occupations in Personal Service	**Major Group 74** **Intermediate Occupations in Transport Equipment Operation, Installation and Maintenance** 741 Motor Vehicle and Transit Drivers 742 Heavy Equipment Operators 743 Other Transport Equipment Operators and Related Workers 744 Other Installers, Repairers and Servicers 745 Longshore Workers and Material Handlers	**Major Group 84** **Intermediate Occupations in Primary Industry** 841 Mine Service Workers and Operators in Oil and Gas Drilling 842 Logging and Forestry Workers 843 Agriculture & Horticulture Workers 844 Other Fishing and Trapping Occupations	**Major Group 94** **Processing and Manufacturing Machine Operators & Assemblers** 941 Machine Operators and Related Worlers in Metal and Mineral Products Processing 942 Machine Operators and Related Workers in Chemical, Plastic and Rubber Processing 943 Machine Operators and Related Workers in Pulp and Paper Production and Wood Processing 944 Machine Operators and Related Workers in Textile Processing 945 Machine Operators and Related Workers in Fabric, Fur and Leather Products Manufacturing 946 Machine Operators and Related Workers in Food, Beverage and Tobacco Processing 947 Printing Machine Operators and Related Occupations 948 Mechanical, Electrical and Electronics Assemblers 949 Other Assembly and Related Occupations 951 Machining, Metalworking, Wood working and Related Machine Operators
	Major Group 66 **Elemental Sales and Service Occupations** 661 Cashiers 662 Other Sales and Related Occupations 663 Elemental Medical and Hospital Assistants 664 Food Counter Attendants and Kitchen Helpers 665 Security Guards and Related Occupations 666 Cleaners 667 Other Attendants in Travel Accommodation & Recreation 668 Other Elemental Service Occupations	**Major Group 76** **Trades Helpers, Construction Labourers and Related Occupations** 761 Trades Helpers and Labourers 762 Public Works and Other Labourers, n.e.c.	**Major Group 86** **Labourers in Primary Industry** 861 Primary Production Labourers	**Major Group 96** **Labourers in Processing, Manufacturing & Utilities** 961 Labourers in Processing, Manufacturing and Utilities